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Nr. 7. Ad. S. Jensen: ON THE FISHERY OF THE GREENLANDERS

KØBENHAVN
C. A. REITZEL, BOGHANDEL
BIANCO LUNOS BOGTRYKKERI
1925

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ON THE FISHERY OF THE GREENLANDERS

BY

AD. S. JENSEN

KØBENHAVN
C. A. REITZEL, BOGHANDEL
BIANCO LUNOS BOGTRYKKERI
1925

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Preface.

THE fisheries of Greenland are of considerable interest, not only in themselves, on account of their peculiar character, as carried on by a primitive people with aid and instruction from European sources, but also as material for comparison with the fisheries of the neighbouring countries of Iceland and North America.

Greenland forms, as it were, a connecting link between these last two areas, situated as it is up at the extreme limit of the North Atlantic. It lies, it is true, outside the great international fishing grounds, yet not so far distant but that fishermen both from Europe and America have made their appearance here from time to time, and endeavoured, with varying success, to draw upon the stock of fish in Greenland waters.

In practical fishery circles on both sides of the Atlantic, considerable interest is taken in the Greenland fisheries, and the question is asked: What possibilities for lucrative fishery are afforded by these Greenland waters? What kinds of fish are to be found there, and in what quantities? The same question is asked by the International Investigation of the Sea in Europe and America — with the further query: What is the position of the stock of fish in Greenland waters relative to adjacent areas? Is Greenland a self-contained region in this respect, or is its stock recruited, partly or wholly, from neighbouring grounds, from North America or Iceland?

Danish colonial officials, and scientists visiting the country, have, in course of time, collected a great deal of information regarding the conditions of the fishery in this great colony of ours, and more is known, perhaps, in this field, than other countries generally imagine.

Up to now, however, no general survey of the Greenland fisheries and the biology of the species of principal economical importance has been available. Readers acquainted with Danish will, it is true, be able to find a good deal on the subject in various publications here and there; foreigners not familiar with this language will, however, find it difficult, if not impossible, to procure the desired information.

The Danish Commission for Investigation of the Sea (Kommissionen for Havundersøgelser), which represents Denmark in the International Investigation of the Sea, has therefore considered it advisable to afford foreigners interested in fishery an easier means of forming an idea of what Denmark has done up to now in regard to making known the conditions of fishery in Greenland. It was further desirable — having regard to the fishery investigations by the Commission in Iceland waters — to have a competent survey of the biology of Greenland fishes, especially with a view to the possibility that the stock of fish in Greenland waters might, as regards some species, be recruited, wholly or in part, from the Iceland region.

The Commission therefore requested Prof. AD. S. JENSEN, of the University of Copenhagen, to give a brief general survey of the Greenland fisheries and the biology of the Greenland fishes. Prof. Ad. S. Jensen, as the leader of the fishery investigation expeditions sent out by the Danish Government with the Brig „Tjalfe" in 1908 and 1909, and later, as Government Expert on the Greenland Fishery question, has more experience and knowledge of the subject than any other authority. It is therefore a matter for congratulation that he has kindly undertaken to write the following survey.

Fluently written, it gives firstly a brief account of the very important investigation work carried out, under very adverse conditions, along the enormous range of the Greenland coast during two short working periods, by the author himself. It shows us as well, how the author was from first to last intent upon utilising all the results obtained to the advantage of the native population of Greenland, whose welfare he evidently has at heart. Particularly interesting are the many important observations regarding the Greenland Halibut, and the manner in which the results of the "Tjalfe" expedition have here been turned to practical use, proving a source of real profit to the Greenlanders. As a matter of fact, there is information of interest to be found under most of the species described.

It will be noticed that several of those species which play a great part in the international fishery carried on in adjacent waters are almost or entirely lacking in Greenland, the haddock for instance, and the plaice and other flatfishes with exception of the halibut and Greenland Halibut. There remains, then, the cod. The author, not having found cod eggs or young fry of the earliest stages in any quantity on the cruises of the "Tjalfe" in 1908 and 1909, is inclined to believe that the stock of cod in Greenland is mainly recruited from elsewhere by immigration. He thus draws attention to an important problem still remaining, which is also of interest in connection with the Iceland investigations. It will have to be solved by marking experiments and other means.

As will be seen in the following pages, the Danish Commission for Investigation of the Sea has already endeavoured to make a contribution to the task; in the summer of 1924, some 500 cod were marked and liberated by Mag. sc. A. V. Tåning from the "Islands Falk" (of the Danish Navy). Magister Tåning had previously, at the end of June, found great quantities of large cod present on the Fylla Bank, in Davis Strait.

Copenhagen, November 23, 1924.

JOHS. SCHMIDT

State of the Fishery in Greenland at the Commencement of the present Century.

When the Eskimos immigrated into Greenland, some five or six hundred years ago, from the shallow-watered regions north of America, their fishery was insignificant.

Gradually, as they moved southward along the western shores of Greenland, they came to tracts where fish abounded. The coastal waters yielded not only sea scorpions and the tiny polar cod, which were known from higher latitudes, but also capelan, the "Fjord Cod" (a small gadoid, *Gadus ogac*), cod proper, the long rough dab, lumpsucker and salmon. Deeper down, there were sea-cat, Norway Haddock and halibut, and in very deep water, the Greenland Halibut and huge Greenland sharks.

The Eskimos, ingenious by nature, learned in course of time to exploit this treasure of the sea. Hooks for snatch and line were fashioned of bone, sinkers were made from soapstone, which is easy to pierce and shape, or, where this was not obtainable, a lump of granite sewn up in a bag served the purpose. The lines were made from thin strips of whalebone, knotted together at short intervals, or from thongs cut from the hide of the bearded seal. A small bag woven of sinew threads, fixed to a wicker ring attached to a handle made a useful hand net for scooping up the capelan when the shoals came sweeping along the shore in spawning time. Salmon were taken with fork, harpoon and barbed and pronged spear, or trapped in cleverly contrived enclosures built of stones in or outside the rivers.

When ships began to visit the country, twine was used in place of the hide and whalebone lines, and sailmaker's thread in place of sinews; hooks are now filed out of nails or purchased ready made at the stores. Otherwise, the implements used are much the same as formerly, the length of line, however, being greatly increased as it was found that the best and biggest fish were often to be looked for at greater depths.

The principal type of fishing vessel is the kayak. Small boats and punts are occasionally used, but the hide-covered umiak, or women's boat is not suited for the purpose. In northern Greenland, the fishing is greatly facilitated by the fact that firm ice covers the waters in winter; the lines can then be let down through holes cut in the ice.

With this simple equipment, the Greenlanders have from ancient times been able to procure as much fish as they cared to have for domestic use. Generally speaking, they fish only for immediate consumption, from day to day; in the case of the capelan, however, (a small salmonide, called by the Greenlanders Angmagssak) some quantities are stored for winter use. There are two reasons for this. In the first place, the capelan swarms in enormous shoals along the coast in the spawning season, so that considerable quantities can be taken even with a small net, and further, the treatment required is simple in the extreme, the fish being merely spread out to dry without even being cut open. In the domestic economy of an Eskimo household, dried capelan are used almost as we use bread.

There were thus facilities in Greenland for something like a real fishing industry; its development, however, was precluded by the fact that the Royal Greenland Trading Company did not buy up fish. An exception was made at a comparatively early date in respect of the liver of the Greenland shark, which is rich in oil. The first attempt at boiling down shark's liver was made in 1805; this was found to yield

an abundance of good oil, and in course of time, a considerable shark fishery was developed in North Greenland.

Even in this brief introduction, mention must be made of the fact that experiments have once or twice been made with cod fishing on a large scale. The chief of these was in 1847—51, under the supervision of a former Iceland merchant, named THOMSEN. Fishing was carried out from boats and from two sloops at various places between Fiskenæsset and Holsteinsborg, both in the fjords and on the banks farther out at sea. The two first years gave a good yield, in 1849 and 1850 the results were poorer, partly owing to unfavourable weather, and in 1851, when only a couple of thousand cod were taken, the work was discontinued. At the trading place of Fiskenæs however, the fishery was still carried on by native labour, the yield being converted partly into dried split cod for the Danish market, and partly into dried whole fish for the other colonies, where it was designed to serve as a kind of emergency ration in times of dearth and for distribution to the poor. This work again was suddenly relinquished in 1865, on the grounds that it kept the natives from their sealing and thus impoverished them.

Fishing vessels of other nationalities have visited Greenland from time to time. Best known are the experimental voyages after cod made by the English during the same years as Thomsen's undertaking. They led to precisely similar results, and were likewise relinquished at the same time. In 1845, two English fishing schooners appeared, and during the following years, especially 1848 and 1849, more vessels arrived, but hardly exceeding ten a year. In 1848, the fishery was successful, but in the very next year it fell off again considerably, and in 1850 and 1851, fish were so scarce that the fishery could not be made to pay. The cod fishery then, could not be made a profitable undertaking for any length of time owing to the irregular appearance of the fish on the grounds. But since 1866, American fishing schooners have regularly made their appearance outside Holstensborg in pursuit of halibut; this lasted until the nineties, when it was discontinued, owing, it was said, to the heavy duty imposed in America on salted halibut from Greenland.

The latest attempt at rational fishery was made in the summer of 1906, at the public expense, by a shipowner, NAPOLEON ANDREASEN, with two cutters from the Færoes. The cod fishery did not come up to expectation, only about 2000 fish being taken at Holstensborg, where also some 1100 halibut were taken. At Jakobshavn, on the other hand, on the Greenlanders' fishing grounds, some 7000 Greenland halibut were taken. This expedition did not discover any new fishing grounds itself.

Meantime, some private traffic in Greenland Halibut and salmon had grown up in some parts of Greenland; the Danes bought the fish from the Greenlanders, salted it down in barrels and sent it home by the Company's vessels. In 1903—04, the directors resolved to take over this business. True, the quantities purchased were not large, but it was nevertheless an important step towards the adoption of fishery as a recognised industry in Greenland.

In the summer of 1906, the present writer went on a scientific expedition to Greenland, and thus became acquainted with the natives and their mode of life.

This was at a time when those interested in Greenland were greatly occupied with the question of the Greenlanders and their future. Some of those familiar with the country maintained that new industries suited to the local conditions should be introduced in addition to the traditional sealing industry, just as in other spheres, where the Greenlanders had been given a certain degree of civilisation by means of Christianity, ordinary schooling (reading, writing and arithmetic etc.) and the opportunity of purchasing certain European commodities (fire arms, cloth, sugar, coffee, tobacco etc. — but not alcohol!). Some slight attempts at raising the fishery for instance, to the rank of an industry had, as above mentioned, already been made, but these had not met with unanimous approval from the experts. One of these in particular, H. KIÆR, the medical officer of the Jakobshavn district, came forward as spokesman for the conservative point of

view in a small book on "Dansk Indflydelse i Grønland", 1906 (Danish Influence in Greenland) which contained rather severe attacks on the Danish administration. This called forth (in 1910) the following observations by the present writer:

"There is a great deal in this book which invites contradiction, and I am surprised that no one has taken the matter up. The author's "method" is in itself open to question. He arrives, for instance, at the result that Greenland is in a state of colossal decline, at present, by taking it for granted that Greenland, as HANS EGEDE found it in 1721 was in every respect idyllic, materially as well as morally. This, I think, should at least be proved to begin with. At any rate, one receives a very different impression on reading the account given by our famous compatriot GUSTAV HOLM, of the conditions prevailing among the then "unspoiled" Greenlanders he encountered on his Umiak Expedition to Angmagssalik on the east coast.

But, as mentioned, Dr. Kiær, starting from the idea that the state of things in Greenland before Hans Egede's day was ideal in comparison with that which has developed under Danish rule, now demands that Denmark should admit that it has been at fault, and should therefore withdraw and institute a retrograde movement, designed to restore Greenland, as far as possible, to the conditions there prevailing before Hans Egede's day.

But even admitting that present conditions in Greenland are by no means ideal, it seems to me nevertheless that an experiment such as that which Dr. Kiær is agitating for would be fraught with greater perils to the little community of Greenland than the retention of the status quo.

For, if we imagine the Greenlanders restored to a purely seal-fishing standpoint, while the other means of income which their country actually affords are suffered to lie fallow, it would be impossible to prevent, for instance, the fishery from falling into the hands of foreigners. But this would mean irreparable damage, since it may be foreseen that a time must come when the sealing can no longer suffice as a means of livelihood for the Greenlanders.

We have already, in all probability, reached the extreme limit of what the sealing industry can yield. In almost every part of Greenland, the question as to how the sealing is progressing elicits the answer that there are no longer so many seals as formerly. And if statistics can be made to show that the number of seals brought in has not diminished, it is probably owing to the fact that the sealers are now compelled to exert themselves more, and extend their sphere of operations, in order to bring in the same quantity of seal.

But in any case, even if we do not adopt the gloomy view of those who maintain that the seals are falling off, it is hardly likely that anyone will venture to assert that they are increasing in number. But the Greenlanders are. Despite all pessimistic prophecies to the contrary, the Greenlanders have shown marked vitality as a people. The number of births exceeds that of deaths, to such a degree that the population will, by the middle of the present century, probably have risen to 20,000, and by the end of the century to 40,000.[1] But we cannot reckon on any corresponding increase in the number of seal which can be reached by kayak from the coast of Greenland.

Instead of beating a retreat, then, it is on the contrary essential to commence, and that promptly, the fostering of new industries, out of regard to the rapidly increasing population. For the native of Greenland is tied to his own country inasmuch as he has learned no trade which might procure him a livelihood elsewhere, and he is thus debarred the outlet of emigration, which is open to those of other lands.

Furthermore, it must be borne in mind that the sealing industry is subject to periodical fluctuations. One year, the yield may be good, in another it may fail, while the yield for different months of the year may also vary greatly. In such hard times, it is well to have another occupation to fall back upon, and I cannot see that it should be more detrimental to the "national" industry that the sealers should have recourse to fishery, than that they should remain idle.

[1] Calculated from the increase in the ten years from 1894—1904, when the population rose from 10,427 to 11,790.

Finally, there is, and always will be, a not inconsiderable number of persons who are incapacitated from hunting seal owing to some physical disability, but who could very well make a living as fishermen. I call to mind a whole series of pitiable figures I have met all along the coast; men suffering from vertigo which prevents them from using the kayak, or too old and weak to endure the hardships of sealing; cripples, men with defective eyesight, etc. It seems to me highly creditable that such individuals should endeavour to maintain themselves by fishing rather than become a burden on their fellows. Dr. Kiær, however, speaks of them as follows: "It is easy to say that a fisherman is no ne'er-do-well in the ordinary European sense (though the majority of them here in North Greenland are), but he certainly is inasmuch as he contributes to a process of development which is denationalising his own country". And he maintains that even though a Greenland fisherman may prove himself a good economist, he nevertheless deserves to be regarded as a detrimental. This is however not the Greenlanders' view; among their compatriots, the fishermen are in reality as much respected as the sealers, as long as they are able to maintain their families without becoming a burden on the community.

In opposing Dr. Kiær's view of conditions in Greenland, I have done so in order to prevent his agitation against fishery and fishermen from possibly creating a like opinion in this country. Such agitation has been found to bear fruit before now. E. Bluhme, who as a lieutenant in the Danish navy visited Greenland in 1863—64, reveals a warm sympathy with the Greenlanders in his book "Fra et Ophold i Grønland 1863—64". But he strongly condemns the split-cod and dried cod industry which he found in progress at Fiskenæsset, believing — erroneously — that the fishery was to be blamed for enticing the natives away from the sealing. And in the following year, the whole undertaking was actually given up, which was, I venture to think, highly detrimental to Greenland. For it meant not only a cessation of an additional source of income which the local population had enjoyed from this industry, the dried fish thus procured had been used throughout the whole of Greenland for doles and poor relief in time of dearth. This being no longer procurable, had to be replaced for the future by — rye flour. Dried fish is in reality a better form of nutriment than rye flour; nevertheless, the natives were systematically induced to believe that the foreign foodstuff was better than the product of their own land.

My ideal of a Greenlander is a man who goes a-sealing when there are seal to be had, and fishing when there are fish. And it is altogether erroneous to believe that these two branches of industry cannot be combined; I know Greenlanders who manage even more. It should be the particular aim of Danish influence in Greenland to work in this direction, encouraging and educating the young to avail themselves of every opportunity their country offers.

Once Denmark has brought the Greenlanders to a point where they have really gained dominion over land and sea, its mission in Greenland will have been completed. Only then can we look confidently to the future of that fine country.

For suppose Dr. Kiær's pet idea were carried out. It might still be possible, given sufficient indifference to the fate of those concerned, gradually to reduce the trade with Greenland until the country had relapsed into an altogether primitive state. And what then? Consider the enormous perils that would threaten these poor people, altogether unprepared, on the day when helpless Denmark found itself constrained to declare Greenland "open"[1]."

[1] My paper from which the passage quoted above has been taken was published in the periodical "Atlanten" Vol. II. 1907—10, p. 607.

Dr. Kiær's answer to that paper is to be found in the same periodical, p. 655.

Fishery Investigations on the West Coast of Greenland in 1908 and 1909.

After my return from the expedition to Greenland mentioned above, I applied to Hr. SIGURD BERG, then Minister for Greenland, with the object of arranging for a systematic investigation of the stock of fish in Greenland waters. The Minister informed me on that occasion that he was himself particularly anxious to ascertain definitely whether it would be possible to create a fishing industry of importance to the Greenlanders, and he invited me to draw up a detailed plan for such an investigation.

I felt it an honour to be entrusted with the task, and submitted proposals accordingly; the Minister then commissioned me to make a two years' investigation of the fishery conditions in Greenland, the Rigsdag voting a sum of 135,000 Kroner for the purpose. The object was to find out where economically important species of fish were to be found in numbers, and on the basis of the information gained, to point out how the fisheries of Greenland might best be exploited by the native population.

Fig. 1. The brig "Tjalfe" at Fiskenæsset. June 1909.

For the purpose of the expedition, one of the old sailing vessels of the Greenland Trading Company, the brig "Tjalfe", was equipped with a 50 hp. motor to drive an auxiliary screw, and a trawl winch for hauling in the various fishing implements, as well as a smaller motor on deck for working the hydrographical instruments. The vessel was further provided with the necessary gear (trawls, lines, seines, etc) for the capture of grown fish, and also with scientific apparatus for determining the distribution of eggs and young fry, and measurements of temperature and salinity. A laboratory was erected on deck for further investigation of the material collected. A large and a smaller motor boat were also procured, together with some dorys, and all other requisites for an expedition to Greenland.

As leader of the expedition, I marked out the courses to be followed, and superintended the fishing experiments and biological investigations. Hr. cand. mag. J. N. NIELSEN, now Dr. phil. and State Meteorologist, undertook the hydrographical investigations required to procure full information as to the distribution and migrations of the fish. The Captain and the first mate were both well acquainted with navigation in Greenland waters, and the crew consisted partly of fishermen.

The first cruise lasted from 3. May to 10. November 1908, the second from 14. April to 17. October 1909. The investigations of these two years together covered the west coast of Greenland from its southernmost point up to Umanak (abt. 60°—71° N. Lat.) i. e. almost the whole of the colonised region, comprising equally fjords and coast, banks and deep sea. For in order to arrive at a thorough understanding of the distribution and migrations of the food fishes, it was not sufficient to keep close in to shore, in the waters of immediate importance for the Greenland fishery; the researches had to be extended to the open sea.

The time at our disposal was short — only two summers — and the area to be investigated enormous, covering a range of 660 miles from south to north as the crow flies. Also, the vessel was not an ideal one for the purpose. As an old Greenland voyager, it was a good safe craft for navigating in ice-filled

waters, but its motor power was slight and gave but slow progress, besides making it difficult to manoeuvre with the various fishing implements. As a result, the expedition could not always work with such thoroughness as might have been desired. We have nevertheless gained a general view of the conditions, and can form a pretty well founded idea as to what improvements might be introduced for the betterment of the fisheries already in progress, as well as what new fisheries might be undertaken with some likelihood of profit for the Greenlanders themselves and thus also for the Danish State. Greenland is, of course, under state control.

Passing now to a brief mention of the investigations of the different species, we may commence with the Greenland Halibut (*Reinhardtius* [*Platysomatichthys*] *hippoglossoides* Walb.), called Kaleralik by the Greenlanders. This large flatfish is of considerable market value owing to the extreme fatness of its flesh, which renders it suitable for smoking like salmon.[1] It will probably prove the staple foundation of the Greenland export fishery.

With regard to this fish, all that was previously known for certain was, that it occurred in great quantities at some few places in North Greenland, viz. in the Umanak Fjord, at Kekertak in the Ritenbenk district, and especially near the iceberg banks of Jakobshavn.

In the northern colonial districts, Christianshaab, Jakobshavn, Ritenbenk and Umanak, the Greenland Halibut is an important item as food for human consumption, in addition to which, the fat skimmed from the water in which it is boiled is used for lamp oil. The fish is also largely used in the same districts for feeding dogs. A doctor or priest, who is constantly travelling about, and therefore obliged to keep many dogs, will use from two to three thousand pounds of Greenland Halibut a year for his dogs alone. And a Greenlander with a team of six dogs will, if he is a good hunter who likes to keep his dogs in good condition, use something like a couple of thousand pounds of Greenland Halibut a year. That is, in places where this fish is obtainable. In winter especially, a lively export trade is carried on from the places where it abounds to those where it is rare or lacking. Kekertak, for instance, sends many sledge loads to Sarkak and other places; Umanak and Kaersut buy it from Umanatsiak and use it for dog food.

From the results of our investigations it appears that the Greenland Halibut has in reality a far wider distribution. We found it in quantities in some of the South Greenland fjords, as well as out in the Davis Strait. This latter occurrence would hardly be of any importance in practical fishery, as the enormous depths (1000 metres and more) together with the difficulties involved by nature of the bottom and the character of the ice, would be too great even for large modern vessels. But in the fjords of South Greenland it is quite a different matter. The fish are here met with under conditions which render them easy of capture. As an example of a fjord specially rich in Greenland Halibut, we may take Agdluitsok, south of Julianehaab, better known, perhaps, under the name of Lichtenaufjord. In August 1909 I tried over the whole of the fjord, and found large Greenland Halibut lying close throughout the whole of this large area, where the depth ranges from 400—520 metres. The average weight was $5^1/_2$ to 7 kg per fish, and the catch amounted to one fish for every seventh hook. The great fjord system north of Julianehaab also, comprising Ikersuak, Kangerdluarsuk, Sermilik, Tunugdliarfik and Nardlunak, is rich in Greenland Halibut; here, however, there were at the same time so many sharks (Greenland shark) that they generally spoiled our line fishery altogether. But in places where the lines were not disturbed by sharks, the yield averaged one fish for every eighth hook.

Another point of fundamental importance in estimating the possible yield of the Greenland Halibut

[1] The method of curing is as follows. The fish is gutted, and its head, tail and fins cut off. It is then split across, and the side pieces (fillets) are cut away from the backbone, cleaned and salted down in barrels, which are sent to Copenhagen and sold to the fish curers there, who smoke the fish and pass it on to the retailers. It is then cut up for "Paalæg" i. e. to be served on slices of bread and butter in the Danish fashion. Its richness makes it excellently suited for this purpose, as a substitute for the more expensive smoked salmon. The "inner fins", that is, the strips along dorsal and ventral edge where the interspinals of the dorsal and anal fins are situated, are left on their respective sides and salted down with the fish, but are cut away before curing, and smoked separately, with the bones in. They are then sold as "Hellefiskefinner" (Greenland Halibut fins).

fishery generally is the discovery made by our expedition to the effect that the Greenland Halibut does not spawn at all in the fjords or coastal waters of Greenland, but out in Davis Strait. We succeeded here in capturing Greenland Halibut with ripe roe (the eggs glassy clear, 4 to 4,5 mm in diameter) and also the tiny newly hatched young (10—19 mm long); these young fry were found close to the bottom (bathypelagically) in that part of Davis Strait where the depth ranges from abt. 680—1660 metres (62° 53′—66° 45′ N. Lat., 54° 15′—57° 04′ W. long.). The young fry gradually move up towards the surface, until about 30 metres down, the length is now 15—24 mm. So great are the quantities of spawning fish on the bottom that a fine meshed net towed behind the vessel for half an hour at 30 metres depth would take up to 300 young fry or more at a time. The pelagic fry are found (in contrast of course to the bathypelagic) not only over great depths, but also over the shallower coastal banks, where they are carried by the current. Bathypelagic fry were taken from 7. May to 9. June, pelagic from 6. May to 29. June. Later in the summer, about the end of August, larger pelagic fry of the Greenland Halibut were found; these went somewhat deeper down than in May—June, viz. 40—75 m below the surface, and had grown to a length of 31—57 mm. These larger specimens were found at 64° 20′—68° 05′ N. Lat. i. e. $1^1/_2$ degrees farther north than the pelagic fry in May—June; it is presumably the current which has carried them farther north in the intervening period.

At the considerable total length of 54—57 mm, the young of the Greenland Halibut are still bilaterally symmetrical, though signs of the incipient transformation are to be found; the eye on the left side, for instance, is distinctly higher up than that of the right, its upper margin reaching up beyond the profile line, and the dark pigmentation, though uniform as regards distribution on both sides, is nevertheless stronger on the right side than on the left. At a length of 68 mm, the left eye has moved so far up as to occupy an intermediate position between the side and the upper edge; the left side is much paler than the right. In a specimen of 86 mm, the transposition of the eye is completed, the left eye being now on the upper margin of the head, but inclining towards the right.

It is thus an established fact that the young of the Greenland Halibut still live pelagically at a length of 57 mm, and my observations suggest that the pelagic mode of life is not concluded until a length of about 80 mm is reached. After the young have passed over into the bottom stage, the blind side loses more and more of its pigment, and gradually becomes quite light in colour, entirely white to the naked eye, the eye side being dark, as usual among the flatfish; this is still the case with specimens of 125 mm length. After this, however, the further development as regards colouring of the two sides proceeds once more in the opposite direction. In a specimen of 153 mm, the blind side is, it is true, still very light in colour, but the dark pigment spots have increased considerably in number. In a specimen 160 mm long, the dark spots are already fairly close together on the blind side, and in a specimen of 167 mm, the blind side appears as no longer white, but with a pale brown tinge, though it seems light in comparison with the very dark eye side. Even at a length of abt. 200 mm. however, the blind side can be comparatively light. From a length of 250 mm onwards, the blind side shows very close accumulations of pigment spots, rendering it dark in colour and somewhat like the eye side; this, as we know, is still the case in the large Greenland Halibut, where the eye side[1] is a very dark, sooty colour, the blind side a paler sooty colour, the outer part of the unpaired fins black, but with a light stripe along the edge.

The young of the Greenland Halibut then gradually assume the flounder shape, and move to the bottom again, but before this stage is reached, a number of them have been carried by the current into the fjords and bays of Greenland, where they grow up as edible fish. There is also a periodical immigration of grown fish. As the stock in the coastal waters is thus constantly being renewed from without, there is no likelihood of its becoming exhausted by the fishery, particularly since the spawning grounds themselves are protected by nature in the practically inaccessible depths of Davis Strait. Line fishing, moreover, which

[1] It is the right side that is the eye side; among many thousand specimens of Greenland Halibut, I have only found two specimens in which the position was reversed.

will be the future form for capture of this species, is also the least destructive method of fishing, as only the larger fish are taken. It would seem that the waters here ought in the future to afford the conditions for a Greenland Halibut fishery on a large scale.

Fig. 2. Greenlanders fishing for the Greenland Halibut from kayaks. Agdluitsok Fjord, August 1909.

I do not of course mean to suggest that a fjord such as Agdluitsok is inexhaustible in the sense that there are no limits to the yield it can produce. Supposing, for instance, that some half-score cutters put into the fjord and fished night after night with their hundred thousand hooks, it is a question whether the fish could immigrate and grow up fast enough to keep pace with the fishery. But practice will show in the future how far one can go, and in the meantime, it will naturally be wisest to begin with a single boat, gradually increasing the intensity of the fishing. And the Greenland Administration can of course always restrict the number of fishing vessels as desired. But even if something like over-fishing were to take place for some time, it would hardly cause any permanent detriment to the stock, as nature itself will seek to restore the balance.

In accordance with this view, I suggested, in the report submitted to the Ministry, that a Danish fisherman should be sent up to Agdluitsok, to fish from a boat and with long lines, and instruct the Greenlanders in this mode of fishing, as also in the method of preparing the fish for trade purposes. Lines must be used in order to get the full advantage of the wealth of Greenland Halibut in Agdluitsok fjord. For the largest fish, and the greatest numbers, keep to the extensive deep parts of the fjord, which the natives could never think of working with their own implements. The Greenlanders cannot fish depths beyond 360—400 m., and the Greenland Halibut is comparatively scarce here, besides being smaller than out in deeper water. Also, the native method of fishing, with lines from a kayak (figs. 2, 3, 4), though good enough in favourable weather, is inadequate in high wind or heavy sea, when only the most skilful fishermen can stay on the grounds, and these sometimes are forced to give up, leaving the fishery at a standstill.

Fig. 3. Greenlander just having finished the uphauling of a Greenland Halibut from a depth of 360 metres. Agdluitsok Fjord, August 1909.

But even with the local method of hand line fishing, it should be possible to obtain something like

500 barrels of Greenland Halibut a year from a fjord like Agdluitsok, whence up to now no fish has been exported at all. I started trading with the natives for Greenland Halibut (fig. 5) with the result that in the course of 17 days, 2753 head of fish were brought in, representing a total weight of 14,267 kg., though the price offered was as low as 4 Øre per kg. This is really an admirable result, considering that the fishing was done at a depth of 360 m. The fishermen sat in their apparently wretched kayaks — a match-wood contrivance covered with sealskin — and let down their lines. The line itself was primitive enough according to our ideas, the hook consisting of a big nail bent and filed down, the trace made from a chain of smaller nails bent into links, and the sinker mostly of broken barrel hoop, the line itself a length of

Fig. 4. Greenlander with his catch of Greenland Halibut. The line has been coiled up on the fore-deck, and the fishes stored on the after-deck. Agdluitsok Fjord, August 1909. From a photo by J. N. Nielsen.

twine. With this simple equipment a skilful Greenlander could, in calm weather, catch up to half a score of fish, (50 kg.) a day. The patience and exertion needed will be better appreciated when it is stated that it took about half an hour to haul in the line.

There is less prospect at present of a similar exploitation of the fjords north of Julianehaab, rich as they are in Greenland Halibut, for the country here is sparsely populated. Even now, however, it might be possible to obtain some pretty considerable quantity from the central settlement of Narssak. In any case, it is reassuring to know that there are these resources in reserve for the growing population of Greenland.

In North Greenland, we did not succeed in locating any new fishing grounds for the Greenland Halibut, but the discovery of facts relating to spawning and migration of this valuable fish in these regions also, may serve as the foundation for an adequate arrangement and exploitation of the fishery, which could yield far more than it does at present.

As already mentioned, the catch of Greenland shark (*Somniosus microcephalus* Schneider), called by the natives Ekalugssuak, has increased very considerably in North Greenland. In the middle of the last century only abt. 2—3000 sharks were taken annually; in the early nineties the catch had increased to abt. 11,500—15,000 head, and at present it comes to abt. 32,000 a year. It is only quite recently that shark fishing has begun to gain a foothold in one or two places in South Greenland. When fishing with lines for other fish, we often had occasion to note that sharks were quite as abundant in South Greenland as in the north. We have found several good new fishing grounds for shark both in the Godthaab and Frederikshaab as well as the Julianehaab districts. If the Greenlanders in these districts could be induced to go in for shark fishing in addition to the sealing, it might prove very advantageous to them.

Fig. 5. The Expedition buys Greenland Halibut from the Greenlanders at Angmagssivik in Agdluitsok Fjord. August 1909.

Some of the best spots for shark and Greenland Halibut were located close to the sites which had been most populated in the time of the ancient Norsemen, to wit, the country on either side of Tunugdliarfik and that between Amitsuarsuk and Igaliko fjord. I took the opportunity of visiting one of these places, Kagsiarsuk in Tunugdliarfik, where Brattahlid, the homestead of Eric the Red, is believed to have stood, and I was, like other travellers, astonished to find the vegetation so luxuriant, despite the fact that the land has lain fallow for 500 years, and shrubs and undergrowth have been allowed to spread unhindered. Even to this day there are it would seem, remarkably favourable conditions for the keeping of livestock on a rational system, with proper treatment of the soil. It is to be presumed that a native population could manage here by these fjords at least as well as the old Norsemen, who could hardly have been more modest in their requirements than the Greenlanders are. In the first place, the Greenlanders could carry on the same means of livelihood as the Norsemen, to wit, the breeding of livestock, especially sheep, with some sealing, and fishing for such fish as are found close in to shore. Furthermore, however, the Greenlanders could add deep sea fishing for shark and Greenland Halibut, which the

Fig. 6. Preparation of Greenland Halibut on board the "Tjalfe". Sydprøven, in Agdluitsok Fjord, August 1909.

Norsemen would hardly have known. At the present day, this fishery would be of great importance, inasmuch as it would provide those engaged in it with ready cash.

The Greenland shark is as a rule from 2,5—4 m. long and may attain a length of 5,5 m. It is remarkable that the Greenlanders should be able to catch so many of these large fish, but this is due to peculiar circumstances. If the shark fishery had to be carried on under the same conditions as elsewhere (in the northern Norwegian and Icelandic waters), where it is only possible to fish in open water with costly vessels and moorings, with crews accustomed to the sea, no shark fishery of any importance could have been developed here. But in Greenland, the position is different, the fishing being carried on, as it were, outside the doors of the fishermen's dwellings, both in the fjords and on the sea coast proper.

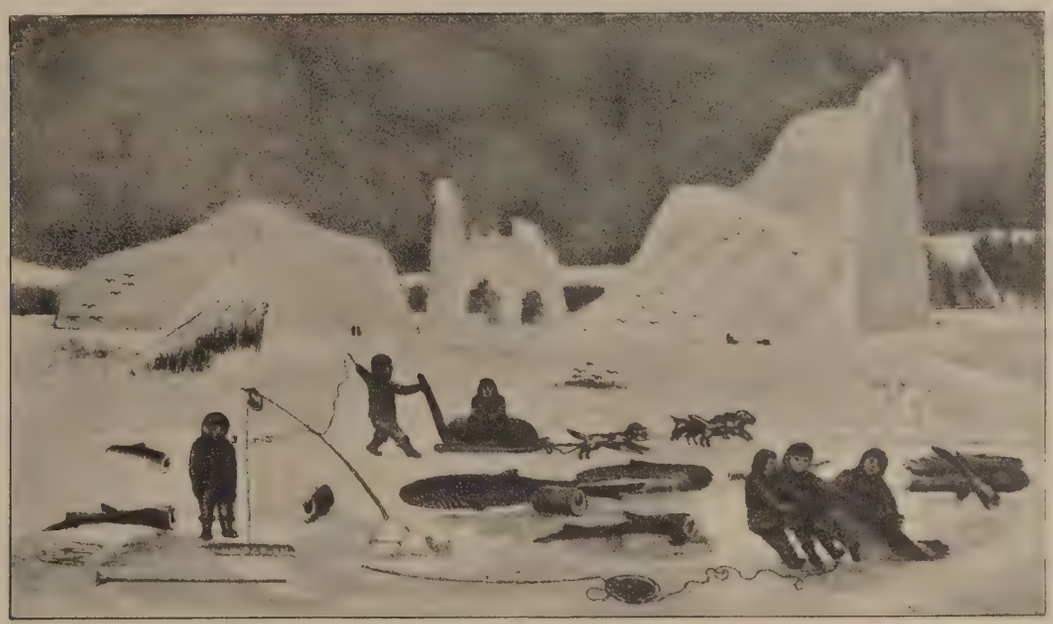


Fig. 7. Shark-fishing in winter in North Greenland. In the ice are cut openings, through which the long fishing-lines are lowered to the bottom. To the left is seen a Greenlander who is watching his line; this is fastened at the upper end of an upright, flexible stick, from the movements of which it can be seen when a fish is biting. In the foreground a "Tuk" is to be seen, that is an implement for cutting holes in the ice. To the right three Greenlanders are hauling up a captured shark. Round about are scattered bodies of sharks cut open and divided. In the background ice-bound icebergs are seen. — From a drawing by a Greenlander, reproduced in RINK's work: Grønland geographisk og statistisk beskrevet, I, 1857.

In winter, the sharks are caught through holes in the firm ice, in summer from small wooden boats and kayaks. The method generally used is handline and hook, the bait used is seal's blubber, rendered more conspicuous by tacking on bits of red shark's gills, and pieces of Greenland Halibut with the fins attached. It seems almost inconceivable that these huge and ferocious fish can be hauled up from such a depth (abt. 250—400 m) with a line no thicker than a piece of stout string, and killed from the kayak with no other weapon but a knife. When the shark has been hauled up to the kayak and its backbone severed, its movement is slight, the belly is then slit up and the liver extracted, the remainder of the carcase being left to sink to the bottom again. Shark fishing can also be carried out at night time by holding a bright lantern above a hole in the ice; the sharks are thus attracted to the surface, and may be caught by an iron gaff.

The stomachs of captured sharks which I examined invariably contained remains of fish (Greenland Halibut, halibut proper, Uvak, cod, catfish, Norway Haddock, salmon (*Salmo alpinus*), skate, and specimens of their own species); the shark will, however, also eat creatures of a lower order (crustaceans, squid, etc.) as well as carrion of seal, whale and birds.

Fig. 8. Catching the Greenland shark. The icefjord of Jacobshavn, Sept. 18th 1900. Photo by R. Bentzen.

With regard to the propagation of the Greenland shark, nothing is yet known beyond the fact that large females are often found with numerous soft, shellless eggs (ovarial eggs) up to the size of a hen's egg (but round); whether these are subsequently "laid" or are hatched out in the body of the mother is still undecided.

The most important product obtained from the Greenland shark is its oil, which is procured from the liver. Natural ("selvløben")[1] shark oil is clear and light in colour, and easily absorbed by the wick; it is used in Greenland for lamp oil, petroleum being forbidden in the houses owing to the danger of fire. In North Greenland especially, shark's oil is the ordinary illuminant among the Danish residents; in south Greenland, seal oil is also used.[2] By far the greater part of the shark oil is exported, it is mixed with seal oil to a specific Greenland type of oil, known to the trade as "three Kroner oil".

In North Greenland, where dogs are extensively used for drawing the sledges, the shark fishery is also of importance as furnishing food for the dogs. When dried especially, sharks' flesh is an excellent food for dogs, giving them power to endure long spells of heavy work without loss of condition. In a fresh state on the other hand, it has a detrimental effect on the dogs; if they eat much of it, they become drowsy and subject to giddiness (they are then said to be "shark-drunk"). After they have been driven a little while, their ears begin to droop, the animals stumble from one side to another, and at last fall down in convulsions and cannot be made to move. After a few minutes, the dog may recover, but on starting out to run again, it has a new attack, shivers all over and can no longer haul. At the same time, especially if the weather be warm,

Fig. 9. Catch of Greenland shark. Cutting the liver out of the fish. The icefjord of Jacobshavn, Sept. 18th 1900. Photo by R. Bentzen.

[1] Natural ("selvløben") shark's oil is prepared as follows: The frozen shark's liver is beaten out with a hammer into a pasty mass. This is placed in a vessel, and as soon as the weather grows warmer, the oil oozes out of itself.

[2] The natives prefer seal oil for their lamps, which, as we know, are used not only for lighting but also for heating purposes. Failing seal blubber, however, shark's oil is used.

diarrhoea sets in, the excrements spurting out like greenish water; sometimes the animals die of the disease. The poisoning is evidently due to some toxin found in the raw fresh meat; it is soluble in water, and can therefore be extracted by thorough soaking (boiling in two or three lots of water). The flesh also loses its poisonous qualities when hung up to dry exposed to the sun and the air, thus giving off its large content of water. In human beings also, the eating of raw shark's flesh may produce symptoms akin to those of acute alcoholic poisoning; here again however, the meat may be rendered harmless by drying or repeated boiling. But at the present day, shark's flesh is of but slight importance as food for the native population.

It is possible that the shark fishery may prove even more lucrative to the Greenlanders than it is now, when only the liver can be sold. Tanning experiments have shown that the skin of this fish can be made to yield a fine variety of leather (shagreen) after the spines have been removed.[1]

As regards the halibut proper (*Hippoglossus vulgaris* Fleming), called by the Greenlanders Natârnak, our expedition has made some rather comprehensive investigations, showing, *inter alia*, that this fish does not spend all its time in Greenland water. It appears first in the early summer, in the deep and constantly "warm" water outside the Great Greenland Halibut Bank ("Store Hellefiskebanke"[2]). As the summer advances, a rise in temperature takes place above this bank, the comparatively shallow waters of which are gradually heated by the atmosphere and the sun; not until then do the halibut move in over the bank towards the coast, especially along the range between Nordre and Søndre Strømfjord.

I quote here from the detailed account in my official report: "On the 3rd and 4th of July (1908) we anchored with a warp at several places on the "Store Hellefiskebanke", and long lines were set out at depths of 50—160 m, but only some sea-cat were caught. It was found that this bank, as well as the "Fylla" bank, was covered with water having a temperature of abt. 0° C. Under the circumstances, then, it was not to be expected that halibut should be found on the banks, since experience in other waters (Norway, the Færoes and Iceland) has clearly shown that the halibut avoid ice-cold water. Nor have any of the Greenlanders ever yet captured a single halibut close to the shore. That American fishing schooners have been able, in some years, to commence their fishery off the coast of the Holstensborg district early in July, or perhaps even at the end of June, must doubtless be due to a difference in the temperature of the sea at that time compared with this year. It was also agreed that "summer" was unusually late in coming this year.

It was necessary now to ascertain where the halibut had their haunts before they arrived on the banks. Some clue to the solution of this question was provided by the fact that the hydrographer to the expedition had, on the voyage up through Davis Strait, noted positive temperatures in the deep water outside the coastal banks. I therefore had our course laid out over the bank, until we were about 1 nautical mile from the firm ice to the west, where we found considerable depths with a temperature of 3° C at the bottom. After a preliminary mishap, in which we lost a line (the buoys were borne down by a powerful surface current) we got 18 halibut on two lines (besides 17 Greenland halibut and some other fish of no value). Lines set out at a later date (latter half of August) nearer the bank, gave 10 halibut. And finally, lines set still farther out in the strait gave the best result of all, to wit, 29 halibut to 300 hooks. This ground outside the bank was further investigated with the trawl and a fine-meshed otter-trawl. Both these implements were damaged by the rocky bottom, but nevertheless brought up a quantity of Norway Haddock and various small fish, besides many pints of huge shrimps (*Pandalus borealis*) of excellent flavour; these last proved to be the chief food of the halibut out here in deep water. From this discovery, then, it is evident that the halibut are to be sought for in the deep and constantly warm water outside the banks,

[1] For further information regarding the Greenland shark see also my paper "The Selachians of Greenland" in "Mindeskrift for Japetus Steenstrup", XXX (1914).

[2] The names "Store Hellefiskebanke" and "Lille Hellefiskebanke" are, of course, misleading, inasmuch as no Greenland Halibut (*Reinhardtius hippoglossoides*, "Hellefisk") have ever been caught on these banks, but halibut proper (*Hippoglossus vulgaris*, "Helleflynder").

if the fishery is to be carried on independently of season and of variations in the temperature of the water. . . ."

. . . "On the 17th of August we put out from Egedesminde and made for the "Store Hellefiskebanke", in order to ascertain whether the halibut had moved in on to the bank. Lines were first set out in the deep water outside the bank, and a good catch was made here, as already mentioned. We then moved inward over the bank, where temperature measurements showed that the conditions had been considerably altered since our last visit. The bottom water on the bank had now almost the same temperature as the deep water outside, viz. getting on for 3° C, as against 0° C at the beginning of July. On laying out our lines it was also found that the halibut had shifted their ground from the deep water in on to the bank. The first really decent catches however, were made with lines set out off the coast at only 60—80 m depth, near "Revøerne" and "Store Vardeø" outside Holstensborg (12—16 halibut per line of 300 hooks). Continued experiments along the coast would undoubtedly have revealed even better fishing grounds. The halibut averaged 50 kg. per head, whereas the average weight of those taken out in the strait was only 25 kg. This is due to the fact that the catches made out in the strait include not only young specimens but also a large proportion of males, which did not reach nearly so great a size as the females (the largest of the males weighed only 41.5 kg. whereas the females often ran to 75 kg. or more) the shallow water, on the other hand, yielded mostly females.

Fig. 10. Greenlander with his catch of halibut; one halibut is seen on the deck of the kayak, another is being towed along the side of the kayak. Holstensborg, September 1908. Photo by H. Deichmann.

In my opinion, the movement of the halibut in summer in towards the coast must be regarded as a migration in search of food. Out in the deep waters of Davis Strait there is but little suitable fish food to be found, and the halibut here, as already mentioned, live mainly on large shrimps. As soon as the temperature permits, the halibut move in to the grounds to satisfy their excellent appetite on the wealth of fish in the coastal waters. This was evident from the stomachs of the halibut taken near Holstensborg, which were full of remains of fish, including Ûvak, sea scorpion, blenny and Sand-eel. In the autumn, when the coastal water turns colder, the halibut are again forced to move back to the deep waters of Davis Strait, where the bottom water remains warm all through the year, and it is here that they have their true home".

In the coastal waters, the halibut are by no means evenly distributed along the whole range; in some parts they lie close together, in others they are more scattered; nor do they appear every year at the same spots. Some years back, for instance, Taseralik in the southern Egedesminde district was much frequented by the Greenlanders; in July and August, one could see here, on a spot otherwise uninhabited, tent after tent, housing some 500—600 natives, including women and children. Later, however, the halibut became scarcer, and the natives moved elsewhere.

The Greenlanders fish from kayaks and with hand lines; the halibut are cut into strips, which are dried in the wind for winter consumption. A few years back, however, the Greenland Trading Company started buying up halibut in the Holstensborg colony; the fish is cut up, salted down in barrels and sent

home. In 1908 I had an opportunity of watching this fishery in progress. When the weather was calm, the kayak men put out to sea early in the morning, returning later in the day each with one or two, sometimes three or four halibut towing alongside (fig. 10). This method of fishery has several disadvantages; in the first place, it calls for fine weather, and thus many fishing days are lost; also, it can only be carried on in the immediate vicinity of the colony, this being the only place where the fish can be sold and prepared, so that the Greenlanders cannot follow up the halibut and fish on the most productive grounds. A further step should therefore be taken, by helping the natives to the possession of long lines and boats, which would give them surer and quicker results than at present; also, salt and barrels should be brought up by motor boat to the places most favourable for actual fishing.

Fig. 11. Greenlanders with their catch of cod. Fiskenæsset, September 1908. Photo by J. N. Nielsen.

As regards the cod or kabliau (*Gadus callarias* Linn.), called Sârugdlik by the Greenlanders, our primary object here was to ascertain whether this fish spawned in Greenland waters or not. Only in the former case, when the fishery would take place among fish congregating in dense masses for the purpose of propagation, could we reckon with a regular, annually recurring fishery on a large scale, similar to that which takes place in Norwegian, Icelandic and Newfoundland waters. In the course of our investigations, however, the cod was only found to be scantily spawning in Greenland waters. The fishery will thus have to depend on scattered shoals of cod moving about in search of food, and will in consequence always be more or less of a casual character. This also agrees well enough with the results of the experiments hitherto made, as noted in the Introduction, with cod fishing on a large scale in Greenland.

The place where we found most cod was the trading station of Fiskenæs in the Godthaab district. We arrived there in the early part of September 1908, and shoals of cod were then to be found everywhere throughout the numerous fjords and sounds in this region; not, however, out at sea. The cod were not moving on the bottom, but at a certain depth below the surface, varying from abt. 14 to 40 m. Nor were they to be found always at definite spots, but moved in shoals, which had to be located from day to day. This movement on the part of the cod was due to the fact that they were in pursuit of the capelan, which were shifting about continually in the intermediate water layers. The fish were mostly small; the average length of a thousand measured cod was 58—71 cm, and the average weight (gutted, split and minus the heads) was abt. $1^1/_2$ kg. In June 1909, I tried over the same waters thoroughly from dorys and motor boats, using various implements (net, line and snatch-hook); here and there in restricted areas some

few cod were found, but the shoals had disappeared. These investigations, carried out at different seasons of the year, together with the statements of natives acquainted with the locality, showed clearly enough that the cod is not a stationary fish at Fiskenæs. They come here in shoals in summer, and a further contingent arrives in September; in October (and to some extent in November) the shoals are still there; after this, the bulk of them move away. A number may remain, and these make their way in from the sounds to sheltered creeks with no current, where they remain throughout the winter. In the following year a new immigration may take place. Some weight has been attached to a tradition current among the natives of mid-Greenland to the effect that in some of the fjords, where no regular settlements exist, but which are occasionally visited by Greenlanders in their kayaks, there are cod all the year round. This may, after what we have seen above, be quite correct, but such occurrence of cod can never be of any great importance, as the fish are only small flocks detached from the great shoals during migration, and remaining here throughout the winter.

Fig. 12. Salmon weir in the river at Nunasarnak (Tunugdliarfik Fjord), August 1909. Photo by J. N. Nielsen.
A stone dam has been built across the river (in the middle of the dam the present writer is standing with a salmon in his hand) allowing the water to flow between the stones, but no passage for the salmon. Below the dam two more dams have been built, crescent-shaped, not joining each other but with some space between them. The salmon, coming from the Fjord, enter the river and proceed into the "weir" between the dams, where they remain, as no further passage is possible. Now and then the "weir" is inspected by a Greenlander, who closes the opening between the two dam halves with a large stone slab, and then catches the salmon which are standing in holes between the large stones in the "weir".

Fiskenæs is one of the places visited comparatively frequently by cod. On going through the books of the trading station relative to the purchases of cod liver,[1] I found that since 1881, there were two periods when the cod failed to appear, in each case for three years, viz. 1884—86 and 1903—05; also, that in certain years of the 16-year cod period the fish were extraordinarily numerous, in others fewer, in others again comparatively few; and finally, that the cod were only very rarely to be taken throughout a greater part of the year, generally only in July, August, September and October; of these again, August and September were the best months.

The cod fishery at Fiskenæs will thus always be a seasonal fishery and can also, which is more unfortunate, fail in certain years. But as the shoals of cod arrive during a season when seals are few, I suggested in my report that measures should be taken for buying up the fish here when they appeared, and preparing them for market, as also at Amerdlok Fjord, near Holstensborg, where cod are often frequently to be found, and these of a larger size than at Fiskenæs. We could then see how the cod fishery developed here in practice, and also possibly at other places later on.

Otherwise, the only places where we encountered any considerable shoals of cod were in the sounds down by Cape Farewell, in September 1909. Small flocks of cod were met with in various places, the northernmost find being right up at Ritenbenk (abt. 70° N. lat.). On the sea banks we found no cod at all.

Two species of Salmon are found in the Greenland rivers and fjords, the large salmon proper (*Salmo salar* L.), called by the natives Kapisilik ("scale salmon"), and the smaller, fine-scaled char (*Salmo alpinus* L.), which they call Ekaluk. The former appears only in small numbers and at few

[1] The fish itself was not bought, but only the liver, which was melted down for oil together with shark's liver.

places (only known from Amerdlok Fjord at Holstensborg and Kapisilik in the Godthaab Fjord), the char, on the other hand, occurs all along the coast.

Our investigations covered a considerable number of salmon waters in south Greenland, and valuable information was obtained. It seems likely now that the rivers already being worked could be made to yield a greater quantity of fish than hitherto, and that salmon fisheries could be established at several new localities. We have also, by investigating the manner in which salmon fishing was carried on by the natives, learned that the Greenlanders are ruining a number of the best salmon waters, by building stone barriers across the rivers for purposes of capture, and thus preventing the fish from reaching the spawning grounds higher up (fig. 12). The natives should be made to understand that this method of fishing is detrimental to their own interests in the long run. The very fine-meshed traps not infrequently used are also highly destructive to the salmon stock; implements used for the capture of Greenland salmon should not be less than 9 cm in the mesh. For the rest, the most important point at present is to help the Greenlanders to procure suitable implements for fishing, and instruct them in the after-treatment of the fish for export purposes.

I must not omit to state that the investigations made during this expedition with regard to the occurrence of Herring (*Clupea harengus* L.) led to a very poor result. Herring had been observed during the previous years in the northern part of the Frederikshaab district, where the kayak men had harpooned a number of the fish with bird arrows. During the nights from 22. June to 1. July (1909) I had experiments made with herring nets (stake and drift nets) partly at the locality above noted and also in other neighbouring fjords, as well as on the outer reefs, but without obtaining any catch worth noting, the total yield amounting to barely a score of fish. Those caught were large fat herring, abt. 33 cm in length. It should be added, however, that the conditions for immigration of herring were probably most unfavourable at that time, there was a great deal of ice in the waters round, and out at sea, in the direction from which the herring would have to come, the ice was so closely packed that the "Tjalfe" had difficulty in forcing a passage. — These were the only places in which herring were taken during our expedition.

In addition to the species already mentioned, our expedition has investigated the possibilities for development of the Greenlanders' home fishery for other kinds of fish which, though perhaps not suitable for export, are yet of some importance in the domestic economy of the natives themselves.

The Norway Haddock *(Sebastes marinus* L.), called Sulugpâvak by the natives, is extremely widely distributed in Greenland waters, from the southernmost parts up to abt. 71° N. lat. and from the inner waters of the fjords to far out in Davis Strait. It requires, however, at least 60 metres of water, and the larger fish keep for the most part to depths of abt. 160—400 m. In the Frederikshaab district especially, the Norway Haddock is so common that an export trade could be established if a market could be found for this good fish, which is as yet almost unknown to the trade. Our experiments with long lines in the Kvanefjord showed, indeed, that out there in the deep water, where the Greenlanders cannot now fish with their own implements, there are unsuspected quantities of Norway Haddock of a size hitherto unknown. One night's fishing with 700 hooks yielded, in addition to other fish, 124 Norway Haddock weighing 367 kg. This should at least be of importance to the native population, who use the fish both for food and for extracting lamp oil. Certain "banks" in the Godthaab Fjord also yielded good results when we tried them with lines for Norway Haddock.

The eggs in the females which I investigated in June and July, were very small (0.2—0.38 mm diam.) faintly yellowish and untransparent. This immature condition of the eggs agrees well with the fact that the Norway Haddock is known to spawn elsewhere in spring; the females taken in summer had thus a good long time still remaining in which the eggs could mature. But it was remarkable that no young fry of the species could be found in Greenland waters in spring or summer. It was not until the 25. September (1909) that young Norway Haddock were taken with the "Tjalfe"'s ring trawl, the specimens being 27.5—43 mm long; they were taken at 60° 05′ N. lat., 46° 35′ W. long, near the surface, with a depth to bottom of 1347 m. As fishing

was carried out during the spring and all the summer with the ring trawl in the surface and intermediary layers at many places in West Greenland, both fjords, coastal waters and in Davis Strait, without finding any young of the Norway Haddock, it must be supposed that the tiny stages do not occur at all in these waters, and that the species, despite its wide distribution here, does not spawn in these regions; the older pelagic fry found must be presumed to have been carried by the current from places far distant. And the water from which these young fish originate may, on biological and hydrographical grounds, be presumed to be Danmark Strait. For in the first place, the investigations carried out by Dr. Johs. Schmidt in 1903 have shown that great quantities of young of the Norway Haddock are found in May—June in the sea south and west of Iceland; and further, the "Tjalfe" in the course of the voyage to Greenland in May 1908, encountered great quantities of newly hatched young Norway Haddock (7—9 mm) pelagically in the north Atlantic S. of Danmark Strait. The warm north-going current along the coast of Western Iceland might carry the young fish to the northward, and the western branch of the Irminger current could then transport them westward toward East Greenland; here, the masses of warm water meet the cold Polar current moving south, and become partly submerged by it, when pelagic young of the Norway Haddock would move up into the polar current, which might carry some of them to the East coast of Greenland. And it is also a known fact that later young stages of this species do occur here; I have seen specimens of abt. 22—30 mm from Angmagssalik, 65° 45′ N. lat., where they appeared in great quantities in June at the water's edge, and in October specimens somewhat older (29—45 mm); these would doubtless have been hatched in the spring out in Danmark Strait. Furthermore, the Polar current or perhaps the warm water beneath it, might carry a great deal of young fish southward along the east coast of Greenland round Cape Farewell, and thence northward along the west coast. The fish would then grow up in the west Greenland waters, but on reaching maturity, would probably move out to places where the water is warmer, to spawn there in the spring.[1]

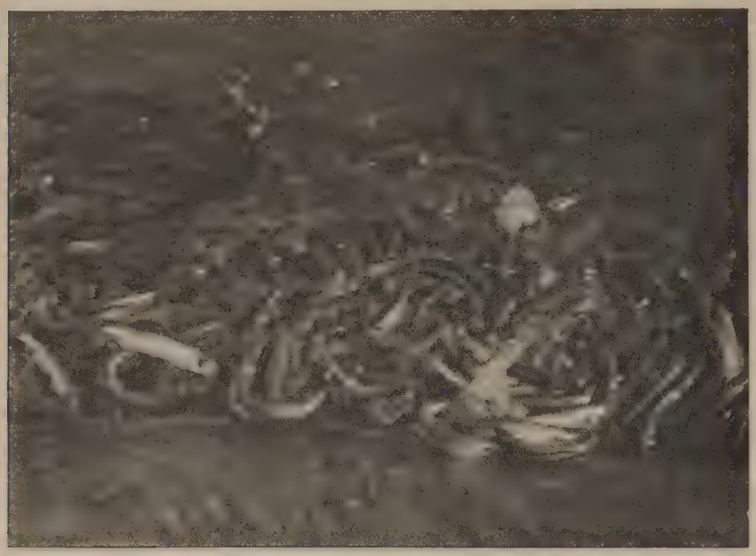


Fig. 13. The capelan in shoals along the coast at spawning time. Holstensborg, June 1908. Photo by H. Deichmann.

Fig. 14. The capelan place at the Nerutussok Fjord. June 1909. Photo by J. N. Nielsen.

[1] For investigations as to the Norway Haddock in Greenland waters see also my paper "Sebastes marinus." in Vidensk. Meddel. fra Dansk Naturhist. Forening, Bd. 74, 1922, p. 89—109.

The Fjord Cod (*Gadus ogac* Richardson), called by the Natives Ûvak, was the object of particular investigation on our part. It appears that this cod, though nearly allied to the cod proper, is yet a distinct species, belonging to Greenland and spawning there. It keeps to the waters inside the outer reefs, or to the immediate vicinity of the shore; it is not found, for instance, out on the banks in Davis Strait. In the fjords and sounds, on the other hand, it is common enough, from the beach close inshore down to depths of over 400 m. The weight runs from $^1/_2$ to 4 kg but may go up to $6^1/_2$—7 kg. The Greenlanders take considerable quantities of Ûvak, but do not utilise this good fish as fully as they ought; among other things, it would be excellently suited for splitting and drying as a reserve provision for the winter.

Fig. 15. Greenlanders catching capelan. Holstensborg, June 1909. Photo by H. Deichmann.

The little herring-like salmonide, capelan (*Mallotus villosus* Müller), called by the Greenlanders Angmagssak, pl. Angmagssat, — male 15—18 cm, female 13—16 cm — is practically lacking in the Upernivik and Umanak districts, but from Disko Fjord and the middle of Vajgat, right down to the southern extremity of the land, it is a regular visitor, coming in each year in enormous shoals to spawn on the coast, and thus forming the basis of a fishery which by Greenland standards must be called very considerable. In May, June and July, for a period of 4 weeks, they come pouring in to land, though not in all parts; they do not touch the rocky islands of the reefs, but prefer the inner waters of the fjords, with a gently shelving sandy (fig. 14), or at any rate level beach. The natives therefore have to go out to the Angmagssak grounds themselves, and each settlement as a rule has its own particular place. Men, women and children leave their homes and go off together, for all can take part in this fishery. All that is needed is to go down at certain times of the day or night to where the spawning fish are densely packed along the shore (fig. 13), and bale them out with hand nets (fig. 15) and buckets, spread them out on the rocks and leave them to dry (fig. 16). The Angmagssak is of the greatest importance to the native population; large

Fig. 16. Capelan put to dry on the rocks. The capelan place at the Nerutussok Fjord. June 1909. Photo by J. N. Nielsen.

quantities are boiled and eaten on the spot, the dried fish being collected in bags or strung on lines to be kept in reserve as an indispensable aid for the winter months if all else should fail. Rink, writing about the middle of last century, estimated the annual production in South Greenland alone at close on $^3/_4$ million kgs. In North Greenland, where dogs are an important factor both as means of communication and for the winter hunting, dried Angmagssak is also a valuable commodity as food for the dogs.

Numerous examples might be quoted showing how advantageous it would be for the Greenlanders to have seines for the fishing of the capelan. The small bag nets they use at present can only take comparatively small quantities during the brief time the fish lie spawning quite close in the shore at lowest water, and wet weather, which prevents them from drying the fish, often cuts off more of the valuable time. With seines, on the other hand, the fish could be taken both somewhat before and somewhat after the actual spawning period, and in the height of the spawning season very large quantities could be taken in a short time when the weather is favourable for drying. Experimental hauls made with hand seines gave as a rule 4—10 barrels per haul. Furthermore, in many places, as for instance, in the Disko Bay area, great quantities of Angmagssat can be taken in autumn, when the fish move along the coast and cannot be taken with the hand net, but easily with a seine; this autumn fish is, moreover, a particularly good article of food, being much fatter than the spring fish, which are in poor condition when spawning. Endeavours should be made to get the natives to take the matter up themselves; several of them might combine, for instance, to share a seine.

Fig. 17. Turning the capelan. The capelan place at the Nerutussok Fjord. June 1909. Photo by J. N. Nielsen.

The Long rough dab (*Hippoglossoides (Drepanopsetta) platessoides* Fabricius), called by the natives Okôtak, is of common occurrence in West Greenland from the southernmost part up as far at least as Southern Upernivik (72° 10′ N. lat.) both in the fjords, on the sea coast, on the banks outside and far out in Davis Strait as well as throughout the whole wide area of Disko Bay, from the beach to over 700 metres depth. In mid-Greenland, we took this fish in considerable quantities, both on hand lines and long lines, with seines and nets; it attains a length of over 50 cm, and a weight of $1^1/_2$ kg. In May, June and first half of July, its pelagic eggs are met with in quantities, and their distribution was found to coincide on the whole with that of the grown fish. The eggs are of considerable size, 2—2.3 mm diam. in comparison with the mature roe grains in the ovaries which are on an average only 1.55 mm diameter; the eggs thus increase considerably in size after being laid, though probably for the most part not until after fertilisation. The flesh of this fish is (apart from the spawning season) very well-flavoured, when properly treated, but it is not of great importance as food for the natives.

Sea-Cat (*Anarrhichas*), called by the natives Kêrak, was caught pretty frequently on long lines, not often in great numbers, but on the other hand, the fish were of considerable size. Distinction should be made between 3 species, viz. the common sea-cat (*A. lupus* L.), spotted sea-cat (*A. minor* Olafsen) and the broadheaded sea-cat (*A. denticulatus* Krøyer). Of these, *A. minor* is by far the most common. The common and spotted sea-cat are a favourite article of food in Greenland, the third species on the other hand being looser fleshed and less esteemed.

The Sea scorpion (*Cottus scorpius* L.), called Kaniok by the natives, is one of the most widely distributed fish along the whole coast, and as it is to be found there all the year round, it is an important item as an emergency ration for the natives, in time of dearth. It is caught mostly by boys who take it by snatching from kayaks and through holes in the ice. Two other common cottoids, *Cottus scorpioides* Fabricius and *Gymnacanthus tricuspis* Reinhardt, are caught and treated in the same way as *Cottus scorpius*.

The Lumpsucker (*Cyclopterus lumpus* L.), native name Nipisa, is not found in the Upernivik district, and is still only rarely met with in the Umanak district, but is common along the southern range of the west coast. It comes in close to shore in April and May to shed its roe, and moves quite close in to the beach, where it is taken with a sort of eel-spear; the roe also, which is very large (diameter of the eggs 2.3—2.5 mm) and greenish in colour, is collected and eaten as a delicacy. The fish itself is eaten both boiled and dried. In autumn, it moves out to deeper water, and in winter it is not seen. The largest specimen I have met with was a female measuring 440 mm and weighing 4 kg.

The Polar cod (*Gadus saida* Lepechin), called by the natives Ekalugak, and by the Danes "Graafisk" (Greyfish) is the smallest of the gadoids found in Greenland. I have never seen it longer than 35—38 cm, and the usual size is only some 20 cm or less. It occurs all along the coast, but is most frequent in the northern districts, where, despite its small size, it is of some importance as food for the native population, inasmuch as it arrives in shoals in the winter months, the dark season, when other sources of supply are scarce. It is caught with small hooks.

Fig. 18. Split cod prepared by the Greenlanders is put to dry on the rocks. Fiskenæsset, September 1908. Photo by J. N. Nielsen.

Besides these species, all of which are of more or less economical importance to the native population, numerous other kinds of fish were taken, for the most part only of interest from a scientific point of view, while numbers of lower forms of animal life were also taken with the various implements. The science of zoology was thus enriched to a considerable extent by these investigations, and this, moreover, with various new and interesting animal forms.[1]

As a result of our investigations, I considered it justifiable to assert that the Greenlanders have much to learn both as regards fishing implements and utilisation of the fish. True, the Greenlander is a master in the art of manipulating a hand-line, but the hand-line method is one of very restricted fishing capacity, and greatly dependent on weather and other conditions. Implements such as the long line, seine and net, will in many cases lead far more surely and rapidly to adequate results. Fortunately, the Greenlander takes a lively interest in anything likely to further the progress of his work for a living; wherever we went, the natives were keen to examine our fishing implements and study the manner of their use; some even endeavoured to copy them as far as the material available permitted. In conjunction with the improvement of fishing implements, endeavours should be made to introduce systematic summer drying of fish for winter consumption. That the Greenlanders are amenable to instruction also in this respect is seen in the

[1] Part of the zoological material has been worked out separately or together with other material and the papers have been published in "Videnskabelige Meddelelser fra Dansk naturhistorisk Forening", "Meddelelser om Grønland", "The Danish Ingolf-Expedition" etc.

case of the outlying station of Fiskenæs, though this, unfortunately, is unique. Half a century has elapsed since the Directorate relinquished the preparation of dried (split and whole) fish in this locality, but the knowledge gained by the natives there at that time is still in the very blood of them. Even to this day one may still see provident-minded folk laying out the gutted and split cod to dry on the rocks (fig. 18), or hanging them up on wooden frames (fig. 19); they have also special earth huts for storing the dried fish. A great amount of costly European provisions might and should be saved in the housekeeping of the natives, for properly dried fish is better than bread and similar products. And neither the Greenlanders themselves nor their dogs need ever suffer actual starvation. In most places, one cannot but feel indignant at the carelessness and improvidence shown. In summer, the most favourable time of year for fishing, little piles of cod may be seen flung down in the dirt outside the houses; the fish are not cleaned, being only intended for that day's meals. Only rarely may one find some few cod cut open and spread out to dry.

Fig. 19. Manufacturing of dried cod by the Greenlanders at Fiskenæsset, September 1908. Photo by J. N. Nielsen.

A great deal of enlightenment will be required before fishery is appreciated as it should be in Greenland. The best means of attaining this end would be, I think, to appoint capable fishermen in the government service at various places, e. g. as managers of the small trading stations; such men could exert a valuable influence upon the natives, teach them to make and use modern fishing implements, and to utilise the products of their fishery to a far higher degree than hitherto.

It is of course a difficult task that now remains, in the advancement of these new methods. But with patient work, there is good reason to believe it will succeed. And the advantages to be gained by carrying through the cause of Greenland fishery is well worth some serious effort. For it offers a prospect of utilising the labour now lying idle, and thus gradually raising the internal economy of the Greenland community to a comparatively respectable position.[1]

Development of the Greenlanders' Fishery after 1909.

During the 14 years which have elapsed since the preliminary investigations of the "Tjalfe" expedition, the Administration of the Greenland colonies, with my assistance as consulting expert, has endeavoured to utilise the results obtained for the benefit of the native population.

The Greenland Halibut Fishery.

The Greenland Halibut fishery in the Julianehaab district was one of the first in which attempts at organisation were made. As it was only to be based on fjord fishery, it was easy to make a start without great expense, and with some prospect of making it in a short time not only able to pay its own expenses but also to contribute something towards other fisheries less favourably situated.

The first fishing station was established in 1910 at Agdluitsok, the fjord in the southern Julianehaab district where our expedition had found the rich occurrence of Greenland Halibut. The station was set up near a small creek close to the trading station of Sydprøven, and was called by the natives "Karsorsat"

[1] Detailed reports of the fishery investigations, briefly stated in the above, are published in: "Beretninger og Kundgørelser vedrørende Kolonierne i Grønland", 1909, Nr. 2 & Nr. 5.

i. e. the fish-corner (figs. 20, 21). A house was built for the Danish fisherman called in to manage the fishery, and other buildings were erected for cleaning the fish, storehouse, bait shed, landing quay etc. The manager of the station was to carry on the fishery for the account of the State; a large and a smaller motor boat were placed at his disposal, as well as some dorys with line-winches, so that he could carry on line fishery with hired native crews and thus show the way to others. He was also to instruct such natives as might wish to learn in the preparation and use of long lines, the materials being furnished to the natives on an easy system of gradual repayments; and finally, he was to purchase the Greenland Halibut offered for sale by the natives, at the same time superintending the work of cleaning, salting and storing the fish. In 1913 another station was set up at Sarfa (fig. 22), farther up in the fjord, as it was found too heavy a task to bring the fish in each day the whole distance (20 kilometres) to the station at the mouth of the fjord; it is managed by a Greenlander.

Fig. 20. The fishery station Karsorsat at Agdluitsok Fjord. July 1914. Photo by R. Bentzen.

The experience of these years has now shown that the Greenland Halibut fishery can be carried on throughout the whole year, and is sufficient entirely to maintain those occupied in it. It is carried on in different ways. When the water is passably free of ice, both boats and long lines are used to a great extent; at other times, when there are numerous icebergs or much heavy ice in the fjord, it is done by hand lines from kayaks, and in the inner part of the fjord, during the severest period of the winter, also from holes in the ice when this is firm enough. At the beginning of winter, however, the fishery is often hindered by the formation of thin ice across the fjord.

Fig. 21. Agdluitsok Fjord seen from the fishery station Karsorsat. July 1914. Photo by R. Bentzen.

The fishery has become of great importance to the population at Agdluitsok. Prior to the establishment of the fishing station, the natives on this closely populated fjord tract (845 souls), especially those of the innermost settlements, were very badly off in economical respects, as the birds had gradually been driven away from the fjord, and the stock of seal was exhausted. True, they had abundance of fish (sea-scorpion, Ûvak, Norway Haddock, sea-cat, Greenland Halibut), so that they need not starve; but as these fish were of no market value, they were unable to procure the barest necessaries in the way of clothing and other commodities.

The yield of the fishery is now sufficient to enable those engaged in it to pay their way all through the year, including also those not engaged in sealing, who were formerly a burden on the community. Many women also, formerly of no occupation, have now well paid work in cleaning and salting the fish. The growing importance of the fishery is apparent, e. g. from the fact that in 1916, a new settlement was formed at Nugârssuk, on the Agdluitsok fjord, by natives who had moved down from Kinâlik, which was situated at Torssukâtak, for the sake of the fishery, while in 1923, a trading station was formed far up in the fjord (at Angmagssivik) to make it easier for the fishermen to dispose of their catch.

Fig. 22. The fishery station at Sarfa at Agdluitsok Fjord. 1913. Photo by Daugaard-Jensen.

The fears which had been entertained as to a possible rapid exhaustion of the stock by intensive fishery for Greenland Halibut in so restricted an area as the Agdluitsok fjord have proved to be without foundation. And the preliminary investigation may in this respect be said to have stood the test. The following survey of the production shows that it fluctuates to an essential degree from one year to another, but cannot by any means be said to be on the decline.

Export of salted Greenland Halibut from Agdluitsok Fjord:

1910-11:	206 barrels	1917-18:	317 barrels
1911-12:	684 —	1918-19:	391 —
1912-13:	394 —	1919-20:	647 —
1913-14:	709 —	1920-21:	689 —
1914-15:	376 —	1921-22:	865 —
1915-16:	1039 —	1922-23:	1247 —
1916-17:	502 —		

The Greenland Halibut runs abt. 250 kilos live weight to the barrel of salted fish; thus the catch for the last-mentioned year amounts to abt. 311,750 kilos delivered at the two stations. This figure, however, does not represent the entire catch, as fish under 3.75 kilos are reckoned as undersized, and are not purchased.

Fig. 23. Motorboat used for halibut fishing at Holstensborg. August 1919. Photo by Daugaard-Jensen.

In 1914, a fishing station was established at the trading station Narssak, in the northern district of Julianehaab, where the "Tjalfe" expedition had likewise located Greenland Halibut in abundance. The fishery here is carried on under the same conditions as in the Agdluitsok fjord, and in a similar manner. Owing to the numerous sharks here, however, the long lines are not much used, and the natives are not so keen on the fishery as those of Agdluitsok, as there are still a number of fjord seals in the fjords near Narssak.

The production at Narssak for the past years has varied from abt. 100—250 barrels; it was greatest during the last three years, culminating in 1923 (250 barrels).

From the north of Greenland, where the buying up of Greenland Halibut was commenced as early as 1904—05, the quantities sent home since 1910 have varied considerably, ranging from 228 barrels (1918—19) to 1223 barrels (1922—23). By far the greater part was from Jakobshavn.

The total export of salted Greenland Halibut from the whole of Greenland since 1910 is as follows:

1910-11:	702 barrels	1917-18:	1032 barrels
1911-12:	1082 —	1918-19:	780 —
1912-13:	754 —	1919-20:	1391 —
1913-14:	1143 —	1920-21:	1848 —
1914-15:	1229 —	1921-22:	1742 —
1915-16:	1767 —	1922-23:	2758 —
1916-17:	1237 —		

Fig. 24. Dory hauling in halibut-line. The bank off Holstensborg. August 1919 Photo by Daugaard-Jensen.

Halibut Fishery.

The first place selected for halibut fishery was Holstensborg. In 1910, two Danish fishermen were sent up here; one of them, Fishing-Master J. M. Jensen, had formerly been engaged in cod and halibut fishery with American schooners off Newfoundland, and would thus appear particularly qualified to supervise this fishery which had to be carried out beyond the reefs, in the banks lying off the coast, if it was to be worked up to any real importance. A large motor boat was placed at the disposal of the superintendent, in order that he could carry up barrels and salt to those parts of the coast off which the halibut appeared in greatest quantities, and also tow the natives' boats out to the fishing grounds (fig. 23), help them to lay out and haul in the lines (fig. 24), and then tow the boats in to the points where the fish were cut up and salted down. He had further to instruct all natives who might wish in the use of long lines, which were provided on the easy payment system (payment was made in kind, by deducting a portion of the catch each time they brought in fish); dorys with line winches were also furnished on the same arrangement. He had also to buy up the halibut offered for sale by the natives, and superintend the cleaning, cutting up and salting of the fish.

Fig. 25. The buildings of the Fishery at Holstensborg. In the background may be seen some of the buildings of the Colony. 1924. Photo by H. Blicher Nielsen.

In course of time, when the manager here had succeeded in overcoming the suspicion with which the

natives at first regarded him, and had made them understand that the new method of fishing was greatly to their advantage as compared with the old mode of fishing from kayaks, the fishery here made good progress, and many of the natives at Holstensborg have provided themselves with boats and long lines.

Fig. 26. The Halibut Fishery M/B. "Carl Ryberg" and "Sulugpâvak" at Holstensborg. 1924. Photo by H. Blicher Nielsen.

The Greenlanders are not seamen in the European sense of the word, and the method of fishing out on the sea banks, as above described, is naturally attended with great risk, both from storms arising suddenly while the little fleet is out on the banks, and from sudden fogs, which render it difficult for the dorys to find their way back to the motor boat. The manager here, however, has, by his calm and sensible manner of taking things, gained the confidence of the natives, who now cheerfully venture out to sea under his guidance; indeed, he has not always been able to take as many as wished to go. As a rule, he tows from five to nine dorys, but when making for a point far out at sea, only four can be taken in tow. In this way, the manager has gradually taught the natives to venture farther away from the shore, and they will now go out with him sixteen or tweenty miles out to sea, where the halibut congregate more closely than inshore. During the past two years, this fishery has been carried on in a new fashion, the lines being laid out and drawn directly by the motor boats; in accordance with the wishes of the natives themselves, however, some of their boats are also towed out to the fishing grounds where they then fish with their own gear (lines and hand lines).

Fig. 27. From the canning establishment at Holstensborg. 1924. Photo by H. Blicher Nielsen.

The halibut fishery is seasonal; as a rule, the fish do not come in from the deeper water until about the middle of July, and the fishery generally is at an end by the close of September, owing to the stormy weather then prevailing, and also out of regard to the export of the fish, which has to be sent home the same year, as it will not stand a winter's storage.

All the halibut are sent home salted, partly in the form of pieces with bone packed in barrels, partly as fillets in tubs. As the Greenland fishing grounds lie so far away from the market for fresh halibut, it would hardly pay to carry the fish fresh on ice to Europe. In 1924 an attempt was, however, made by establishing a canning station at Holstensborg, where the halibut could be cooked and packed in two pound tins (fig. 27).

The number of halibut caught shows great fluctuations, from 700—3000 fish per season; the greatest yield was in 1921, with 3044 and in 1923, with 3122 fish. These figures do not include the fish used for home consumption, comprising in particular a large quantity of undersized fish (halibut weighing less than 10 kilos gutted and minus the heads are not purchased for export).

Halibut fishery is carried on in a similar manner and on the same principles at two other stations, viz. Agto in the Egedesminde district, and Kangâmiut in the Sukkertoppen district, where the fishery is under supervision of the managers of the trading stations, after the preliminary work had been carried out by fishermen called in for the purpose (the one at Agto was from the Færoes). The station at Agto was established in 1912; the fishery here begins as a rule early in July and only lasts till about the 1st of September, as there is no opportunity of shipping for home after this date. The fish are caught along the range between Manîtsok and the mouth of the Northern Strømfjord; during the past years, the catch varied from 60 to 200 barrels of salted halibut. The station at Kangâmiut was established in 1911; the fishery here commences about 1. July, and ends in September; the grounds lie between Savssat and Kangâmiut. The catch here varies between 325 and 800 fish but rose in 1923 to 1542.

Fig. 28. From the Halibut Fishery at Kangâmiut 1917. Photo by N. L. Nielsen.

Cod Fishery.

It was in the autumn of 1908 that the "Tjalfe" expedition located great quantities of cod at Fiskenæsset; and in the following summer, a fisherman from the Færoes was sent by the authorities to the district, where he remained for three months, to teach the inhabitants to prepare split dried fish (Klipfisk). Unfortunately, the cod failed altogether to appear in 1909, but this possibility had been counted with, and the fisherman had been ordered to teach the natives the method with Fjord Cod (Ûvak) which are always found in great numbers at Fiskenæsset. His stay there was thus not fruitless, as it was afterwards possible to leave the future operations to the manager of the trading station on the spot. At the same time, the buildings required for the work were erected.

In 1910 again there were still no cod at Fiskenæsset; since then, however, the fish have never again failed to appear.

As a rule, the cod make their appearance at Fiskenæsset about the middle or end of July, rarely in the first days of this month, and generally leave towards the end of October. In some years there are great numbers, in others smaller numbers and in other years again very few. The fish arrive first of all at the mouth of Fiskenæsfjord, and then move up the fjord to Lichtenfels and Fiskenæsset; by September they may, if in large numbers, have penetrated to the inner sounds and ramifications of the fjord, as the fish are continually on the move. It is thus necessary to locate the shoals from day to day, and in this the natives are assisted by a motor boat stationed at Fiskenæsset. Sometimes the cod proceed no farther than the mouth of the fjord, and soon move out to sea again, to the outer islands, and the native boats are then towed out after them by the motor boat stationed on the spot.

During the first years, all the fish caught was made into split cod; some was ready early enough

for being sent home to Denmark the same year, the remainder had to be stored in Greenland as salted fish, and prepared the following spring, only arriving in Denmark in the following autumn. Later, it has become the custom to send home all the fish which can be got off by the last vessel sailing as salted fish, so that only the fish left over through the winter is prepared and sent home as klipfisk.

The quantities purchased for the past 11 years are as follows:

1913: 64,500 kilos	1917: 84.000 kilos	1921: 74,000 kilos
1914: 60,000 —	1918: 132,000 —	1922: 84,300 —
1915: 42,500 —	1919: 121,000 —	1923: 38,500 —
1916: 74,650 —	1920: 117,000 —	

This new industry has greatly helped to improve the position of the natives here, and the advantage is shared by the entire population (175 souls), as both women and children take part in the fishery, or earn something by cleaning fish or other work associated with the export fishery.

In 1912, the cod fishery was taken up as a recognised industry in the Holstensborg district in the fjords round the trading station Sarfânguak and has been carried on ever since, the yield varying from year to year, but never failing altogether. The fishery was started by the Danish-American fisherman already mentioned, who travelled about the district and showed the natives how to deal with the fish, the processes of splitting, cleaning, salting, storing, drying and packing. It was found that the cod came in at several different places, and fish houses were therefore erected in support of the fishery at the following places (besides Sarfânguak) in this fjord district: Sarkardlît, Ikerasârssuk, Kekertalik, Kangerdluarssuk and Itivdlek. The natives then move out here in the cod season, especially to Kekertalik, which is visited by folk even from the colony of Holstensborg itself. As the native tents are small and in poor condition, barracks have been built in course of time at the fishing stations, to accomodate native fishermen coming from a distance. A couple of motor boats have been provided for the purpose of carrying salt, barrels, trade goods etc. to the fishing stations, and bringing back the prepared fish to the colony.

The cod arrive somewhat earlier in the fjords about Sarfânguak than at Fiskenæs, which lies somewhat farther south, generally about the beginning of June (which, *inter alia*, seems to suggest that the fish come from the American side). In some years, the cod may arrive so early at Kekertalik, which is the richest of the fjords as far as cod are concerned, that the ice has not yet had time to break up; the cod follow the Angmagssat, which can move in under the ice. When the fjord is once clear of ice, the Angmagssat run up close to the beach to shed their roe on the algæ, the cod then follow after, and at this time, when the cod find sufficient food in the Angmagssat alone, they are not to be taken on a hook, but have to be fished for with nets. When the Angmagssat have moved off from the shore again, and the cod are farther out in the fjord, handlines and long lines often give better result than the nets. The fishery comes to an end as a rule in September or October, according to the state of the weather, at any rate, when both fish and nets at last are frozen stiff.

The quantities purchased were as follows:

1912: 23,500 kilos	1916: 50,000 kilos	1920: 87,000 kilos
1913: 25,000 —	1917: 51,000 —	1921: 99,000 —
1914: 35,500 —	1918: 105,000 —	1922: 68,000 —
1915: 40,000 —	1919: 100,000 —	1923: 109,000 —

Part of the catch is prepared as Klipfisk, but the greater part is sent home salted.

In the Sukkertoppen district, the cod seem to appear most constantly at Atangmik, where the fishery was commenced in 1914, and is under the supervision of a Greenlander who learned the work at Holstensborg. During the past 7 years, the quantities brought in have varied from 22,000 to 52,000 kilos per annum.

In 1922, considerable quantities of cod were located both north and south of the Sukkertoppen colony, and accordingly, fishing was commenced in several places (Agpamiut, the Colony, and Ikerasak) and in 1922, 100,000 kilos were bought up; in 1923, 71,547 kilos.

At Kangâmiut shoals of cod appeared in July 1922, and in the course of 10 days some 19,000 kilos were bought up; in 1923, however, the cod failed to appear here at all.

At Godthaab, in 1919, cod appeared in such quantities that an attempt was made to buy up the fish here, and the quantity bought up was 18,700 kilos. Cod have also appeared here since, the quantities brought in for sale being as follows: 1920: 46,570 kg; 1921: 18,600 kg; 1922: 44,700 kg.

Fig. 29. Washing the cod. Frederikshaab, August 1919. Photo by Daugaard-Jensen.

In 1923, the fishermen were assisted by a motor boat, which enabled them also to fish at the mouth of the fjord, at the Kûk (Koek) islands, where the fish appear earlier than in the fjord itself (middle or end of August), and the yield that year rose to 110,000 kilos.

At Frederikshaab, no cod worth mentioning have appeared as long as my acquaintance with the Greenland fishery goes (from 1908) until 1917, when the governor of the colony reported that surprising quantities of cod had appeared in the district, an experimental buying up of the fish from the 6. August to the 21. September bringing in 81,500 kilos. In 1918 again the fish appeared here in quantities, and from the 22. July to the 10. August, 62,000 kilos were bought up. So also in 1919, when 148,000 kilos were bought up during 36 fishing days. In 1920 however, the cod appeared only in small numbers, and not until the 10th of August, so that 33 fishing days only yielded 23,000 kilos. The year 1921 was still poorer; the cod did not arrive until the 22. August, and only 6,500 kilos were brought in for sale. In 1922, the cod arrived on the 19th of August and in small quantities, the yield being only 40,000 kilos. Finally, in 1923, no cod appeared at all in Frederikshaab; the fish were sought for by motor boat and rowing boats throughout all the neighbouring waters for a radius of 10 miles, the extreme periphery comprising the Storø, the western skerries, the island group south of Kvanefjord, Kvanefjord, Kangerdluarssuk and the Nerutussok fjord, with no result whatever.

Fig. 30. Salting the cod. Frederikshaab. August 1919. Photo by Daugaard-Jensen.

In the Julianehaab district also, no cod worth mentioning had appeared until the summer of 1917, when great quantities were observed. As at Frederikshaab, so also here at Julianehaab in the following year a man well acquainted with the preparation of salt fish and klipfisk was sent up to instruct

the natives in the process, the district also being provided with the requisite material for regular cod fishery. Furthermore, fish houses have in course of time been erected at Kagssimiut, Sardlok, Nanortalik and Augpilagtok. Fishing stations had already been established, for the Greenland Halibut fishery, at Narssak, Karsorsat and Ilivermiut, so that all the most important places in the district were now in a position to take advantage of the opportunity, should the cod appear.

In the past six years, the following quantities of cod have been brought in here.

1918: 107,000 kilos	1921: 166,000 kilos
1919: 98,000 —	1922: 114,000 —
1920: 83,000 —	1923: 307,500 —

By far the greatest quantity was taken at Karsorsat, smaller quantities at Nanortalik and Sardlok, and very little at the places farther up in the fjords Narssak and Ilivermiut. At Kagssimiut and Augpilagtok, the fishery is still only beginning, and at the colony of Julianehaab itself, cod have only once (in 1918) appeared in sufficient numbers for any trading to be done.

The cod fisheries taken together show the following figures for the yield of the past twelve years:

1912: 23,500 kilos	1916: 124,500 kilos	1920: 396,500 kilos
1913: 89,500 —	1917: 243,500 —	1921: 413,500 —
1914: 95,500 —	1918: 428,000 —	1922: 522,500 —
1915: 82,500 —	1919: 612,500 —	1923: 681,000 —

The marked advance in the yield since 1917 is due to the fact that the cod that year began to make their appearance in the parts of Greenland lying south of Fiskenæsset, i. e. in the Frederikshaab and Julianehaab districts. True, the occurrence of cod in the Frederikshaab district has been very uncertain, but on the other hand, the Julianehaab district has given a more constant yield, culminating, moreover, in the year 1923, when the yield from Frederikshaab was nil.

The development of the Greenland cod fishery has thus been as follows:

During the years when the "Tjalfe" expedition was making its investigations, (1908 and 1909), cod were only found in any quantity at a few places, and for the time being, only one spot could be pointed out as promising for cod fishery, to wit, Fiskenæsset, and even here the cod failed to appear during the first two years (1909 and 1910). Since then it has been found that the cod also appear fairly regularly in the fjords at Sarfânguak, so that it has been possible to establish a cod fishery here. The quantities taken, however, were very slight. A change took place in the summer of 1917, when cod appeared in great quantities throughout the whole of the Julianehaab and Frederikshaab districts; this was repeated in the summer of 1918 and 1919. After this three-year period of abundance, the rich fishery was at an end as regards the Frederikshaab district; in 1920—23, the cod either failed to appear or appeared in very small numbers. In the Julianehaab district likewise, the cod have never been found in such quantities as during the three years from 1917—19; a number of shoals however, appeared off the shore, and as all the important fishing stations were now equipped for the capture of cod, when the fish did appear, respectable quantities were now taken at some places, 1923 even showing a yield exceeding that of any previous summer.

Since 1917, the cod fishery has advanced to such a degree that it is now on a level with the other fisheries, indeed, has actually outstripped them.

The Ûvak Fishery.

As far back as 1910 a consignment of klipfisk was prepared from Fjord Cod (Ûvak) at Fiskenæsset, but as this undertaking did not then pay, it was discontinued.

During the late great war, when the price of fish rose to an unprecedented level, the experiment was renewed. In 1917, some thousands of kilos of Ûvak were prepared as salt fish, and the product, when sent

home, was found to sell well. In 1918, 69,000 kilos of Fjord Cod were bought up in the Julianehaab district, and in 1919, 28,500 kilos; meantime, however, the price of fish fell again, and as the salt fish prepared from Fjord Cod are small and thin-fleshed compared with the large cod or cabliau, it was hard to find purchasers for the new product, which at last proved quite unsaleable. It was therefore necessary to stop buying up Ûvak, and cease sending it home salted. This was to be regretted inasmuch as the industry had been a kind of reserve to fall back upon in years when the large cod failed, and the natives could be set to catch Ûvak, which is a stationary fish in the Greenland waters, and abounds in many places. Possibly however, the experiment may be renewed if there should appear to be any likelihood of finding a market for the fish.

Shark Fishery.

Shark fishery was, as said above, started as an industry already in the first years of the last century, as experiments had proved shark liver to yield good and abundant oil. As late as in 1828 the yield of the shark fishing however hardly amounted to 20 barrels of oil; in the fifties the yield had increased to 200 or 300 barrels a year.

During the 3 last decades the yield of shark liver has been as follows:

	North Greenland	South Greenland	All Greenland
1890—1899 average yield a year.....	3220 barrels	343 barrels	3564 barrels
1900—1909 — — - —	4378 —	1010 —	5388 —
1910—1919 — — - —	3823 —	1881 —	5704 —

From this it appears that North Greenland produces by far the largest quantity of shark liver, but that the production of South Greenland has at the same time been increasing on a relatively larger scale.[1]

The Salmon Fishery.

The true salmon (*Salmo salar*) as already mentioned, occurs in too small numbers to be of any importance.

As regards the char (*Salmo alpinus*), proposals were put forward some ten years ago, from influential quarters, for a more adequate exploitation of the Greenland salmon rivers, and the Greenland Administration accordingly instituted experiments with canning of salmon, though it was not believed that such an undertaking could prosper. The canning station was established at Grædefjorden, as the rivers flowing out into this fjord were, as Greenland rivers go, comparatively rich in salmon, and had maintained their stock unimpaired by the detrimental methods of fishing employed by the natives.

The station was set up close to one of the rivers and a motor boat, making three trips daily, fetched the catch from the river on the other side of the fjord. From the very first, every precaution was taken to secure the rivers in question against any overfishing. No implements were set out in the rivers themselves, but only in the fjords outside their mouth, and those here were taken up once a week (from Saturday evening until Monday morning) in order to afford the spawning fish an opportunity of ascending. Furthermore, the nets used were of sufficiently large mesh to ensure that only the large fish were captured.

In spite of all this however, the result was poor. Even when the fishery was at its height, the number of fish taken was too small to pay the working expenses of the station, and the yield rapidly declined. In 1914, during the period from 13. July—22. August, 18,250 kilos of salmon were taken, representing 23,000 one-pound tins; in 1915, the output was about the same, viz. 22,600 tins, but in 1916 only 13,000, and in 1917 only 11,400 tins. The difficulties arising out of the great war — lack of material

[1] This account is in so far incorrect as the statistics do not make any distinction between shark liver and cod liver, putting it all down under the common name of "liver". As far as North Greenland is concerned, it is of no consequence, as no cod worth mentioning is caught there, but, as regards South Greenland, the increase in the yield of liver is to a certain degree connected with the increase in cod-fishing of the decade 1910—1919.

for tins etc. — which affected all factory work, rendered it impossible to continue, and the result of the four years' work was not such as to invite any subsequent resumption of the experiment, though the entire technical apparatus had worked satisfactorily, and the canned salmon easily found a market.

The exploitation of the salmon rivers is therefore now carried on in the following way: salt and barrels are carried up to the rivers, where the cleaning and first salting of the fish take place; the barrels are then shipped to the colony, and the fish resalted and sent home the same year.

Only a few of the rivers are fished with a view to export, as it is only few which yield a sufficient quantity of salmon to pay expenses. The fact is that the ice-free outer fringe of Greenland is narrow, and watered by innumerable little streams, each of which provides the spawning ground for a small stock of salmon; true rivers with extensive spawning grounds do not exist. This point is often lost sight of, for instance when people ignorant of the facts compare the Greenland salmon waters with those of Alaska.

The quantities of salted salmon exported since 1910 are as follows:

1910: 368 barrels	1915: 330 barrels	1920: 308 barrels
1911: 390 —	1916: 218 —	1921: 350 —
1912: 422 —	1917: 107 —	1922: 108 —
1913: 546 —	1918: 99 —	1923: 178 —
1914: 259 —	1919: 139 —	

The greater part of the yield here is from rivers in the Sukkertoppen and Holstensborg districts; it is here that the fringe of open land is broadest, and the rivers accordingly of some size; a smaller quantity comes from the Godthaab district. The salted salmon is not rich enough to be smoked, and must therefore be utilised in another way. The market value is further impaired by the fact that not all the fish are red-fleshed; many of them are pale, the so-called »white salmon«, though as a matter of fact one may find every shade of transition between the "white" and the "red" salmon.

All the numerous small streams are visited by the Greenlanders when the salmon are ascending to spawn (in July and August) and salmon fishing is a regular summer treat for the natives. Part of the catch is boiled and eaten on the spot, or sold, fresh or smoked, to the Danes, but some quantity is dried and stored for winter use.

Concluding Remarks.

If now, from the experience of the first fourteen years, the question were to be put, whether the fishery has been to the advantage or disadvantage of the Greenlanders, the answer would probably be an unhesitating affirmative as to the advantage. Through the fishery, the income of the community of Greenland has been increased, especially for the benefit of the poorest Greenlanders, to wit, such men as are for some reason or other incapacitated from hunting seal, therefore a burden on the community and belonging to the despised class of the "ne'erdowells"; many women are also occupied in cleaning and salting the fish, in some places women and children even take part in the fishery itself (cod fishing). But also to many seal hunters the fishery is profitable, as in tracts with opportunity for fishing they may have recourse to this new industry in periods which are poor in seal. The fears which have been entertained in certain quarters that the furthering of the fishery might turn out to be a competitor fatal to the continued existence of the national industry, seal-hunting, have proved to be without foundation — seal-hunting is so enticing to the Greenlander that he leaves the fishery as soon as the seal arrives. On the contrary, the fishery may at present be said to be rather of advantage to the seal-fishing, in so far as some of the Greenlanders who are now becoming skilful seal-hunters would never have become so, had it not been for the fishery providing their supporters or themselves as children or young boys with the means for the equipment of a seal-hunter, the food, the clothes, and the home which are indispensable if a Greenland boy is to grow up to be a healthy and strong man, sufficiently

vigorous and bold for a seal-hunter's work which lays great claims to the mental and physical strength of its performer.[1]

If thus the fishery, in spite of its being recently established as an industry, is already of no small importance, it ought at the same time to be emphasized that it may become of still greater consequence along with the development of its organisation. But in Greenland more than in any other country it is true that time is needed in order to carry through an affair of this kind at which we have, so to say, to begin at the very foundation.

One of the tasks which are now at hand is a more intensive utilising of the arrival of the shoals of cod, than is the case now. It is, of course, unfortunate that a settlement at which the cod has been arriving for some years and given rise to ample fishery, has to give up fishing because the cod fails there and is perhaps making its appearance at another place on the coast in larger shoals than the local inhabitants are able to turn to account. The main point is to have the mode of fishery altered so that the Greenlanders may provisionally settle in the places where the cod comes in. Such a move has, however, already been practised on a smaller scale in several localities, especially in the district of Holstensborg, where inhabitants of the colony, in early summer, before their own halibut fishery has yet commenced, go southwards to other places, especially Kekertalikfjord, where the cod generally appears. Here the Directorate has, as said above, set up small stations with sheds for the treatment of the fish, and barracks for the Greenlanders, and also helps the Greenlanders with motor boats for their travelling out and home. In a similar way the inhabitants of Kangâmiut, who are skilful fishermen, have in early summer taken part in the cod fishery at Agpamiut, where the natives are behind in development, and besides making a good deal for themselves they have served as incitements to their countrymen of lesser capability. This principle — the moving of the inhabitants to the places where the fish occurs — may also, occasionally, be practised in the southern districts, so that for instance people from Frederikshaab might be carried to the Godthaabsfjord, together with their store of salt, if the cod should be abundant there and not coming in to Frederikshaab.

Fig. 31. The M/S "Hvidfisken" (White Whale) of the Fishery. Holstensborg 1924. Photo by H. Blicher Nielsen.

Another main point, is this, to enable the Greenlanders to carry on the fishery on the banks off the coast, from vessels which are large enough to remain at the banks for a longer space of time, instead of having to go back to the shore every evening, as is necessary now for the motor boats used for the bank fishery. As an introduction to such a fishery the Directorate has in this year (1924). procured and sent off to Greenland the motor schooner "Hvidfisken", of 76 tons and with an engine of 40 H. P. With a Danish fisherman as manager and a crew of Greenlanders it is used for halibut and cod fishery.

[1] Compare report delivered by the committee gathered in the month of December 1920 for a discussion of the affairs of Greenland, p. 19 (København 1921).

Postscript.

At the instigation of Dr. JOHS. SCHMIDT, Leader of the Fishery investigations in Iceland and Færoe waters, an opportunity was found for Hr. Å. V. TÅNING, M. Sc., in the summer of 1924, to proceed on board the "Islands Falk" of the Danish Royal Navy, during its voyage of inspection to West Greenland, and to make investigations there, and collect information as to the fishery. From the reports sent in to me regarding this work I purpose here to quote some points of interest regarding the cod fishery and the biology of the cod.

Information was sought regarding the time when the cod moved in to the west coast of Greenland this year, and the conditions of its stay there. Hauls were made on the banks and elsewhere, with the usual nets for capture of young fish. Pelagic fry of cod, however, were found only in very small quantities, compared with what can be taken for instance on the west coast of Iceland. Material was also collected for investigation of the year classes of cod here found; further, material for racial investigations was procured, with a view to further elucidating the origin of the stock of cod in West Greenland waters. In connection with this last, markings of large cod were commenced at "Fyllas Banke" on the 24th of June. These markings were continued, partly at the mouth of the Godthaab Fjord, partly in the Sukkertoppen district June/September. Nearly 500 marked cod were liberated, mostly of the mature year-classes; in the event of any being recaptured, it is hoped that we may obtain some information as to the migrations and spawning grounds of the West Greenland Cod. From investigations and fishing with Greenlanders along the coast, as well as from information obtained from fishery experts on the spot, Mag. Tåning considers that the cod fishery in this, the extreme north-westerly margin of the area of distribution of the cod, in the Atlantic, is highly variable from year to year in the different localities, and has not the prospects of a large-scale Atlantic fishery, though it will doubtless be of growing importance to the frugal population of the country.

Further, it was found, by fishing experiments from the "Islands Falk" in June, that good and large cod averaging abt. 10 kilos., were present in abundance on "Fyllas Banke". Tåning is also able to state that in 1922 and 1923, the Danish warships, "Islands Falk" and "Fylla" found cod on "Fyllas Bank" in quantities during July. Hr. Tåning adds, however, "It is too early to say anything as to the stability of the bank fishery in the summer months". On the banks north of "Fyllas Banke" there were but few cod.

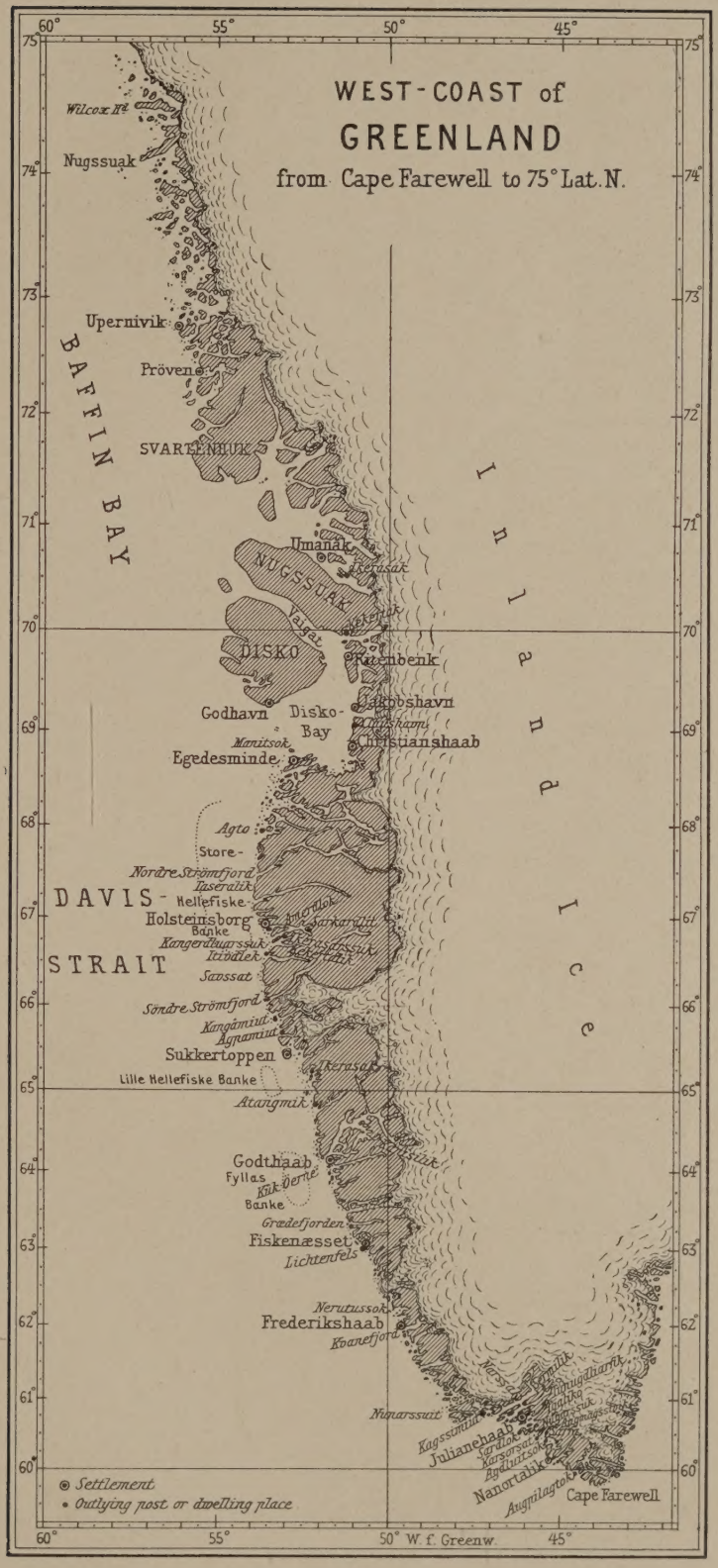
According to the reports sent in from the fishing stations to the Greenland Government, as to fishery in 1924, the cod appeared on the coast in abundance from Holstensborg South district to Godthaab, as also in the Julianehaab district; at Fiskenæs, on the other hand, the cod appeared only in small numbers, and in the Frederikshaab district not at all.

In contrast to former years, great shoals of small cod appeared towards the end of the summer; so small however (27—35 cm.) as to be unmarketable.

In view of this and other unusual phenomena on the west coast of Greenland in the summer of 1924[1] one cannot but call to mind the following statement in "Science" (N. S. vol. LIX, No. 1534, May 23. 1924): "The International Ice Patrol, operating from Halifax, reports that the temperature of the sea covering the 35,000 square miles of the Grand Banks of Newfoundland is 7 degrees higher than normal for the time of year. Similar conditions are found in neighboring waters; iceberg and ice-floes are almost non-existant south of Newfoundland, and wide-spread, though temporary changes in the climate of eastern America and western Europe are thought likely to occur in the near future by Lieutenant EDWARD H. SMITH, of the U. S. Coast Guard Service, who reports these phenomenal conditions".

[1] For instance, coalfish, (*Gadus virens* L.) were caught there this summer for the first time during the 17 years I have followed the Greenland fishery.

600. 11/V 25.


WEST-COAST of
GREENLAND
from Cape Farewell to 75° Lat. N.
60°
55°
50°
45°
75°
74°
73°
72°
71°
70°
69°
68°
67°
66°
65°
64°
63°
62°
61°
60°
Wilcox Hd
Nugssuak
Upernivik
Prövenes
BAFFIN BAY
SVARTENHUK
Umanak
NUGSSUAK
Kerasak
Vaigat
DISKO
Godhavn
Disko-Bay
Jakobshavn
Christianshaab
Egedesminde
Agto
Store-
Nordre Strömfjord
Iuseralik
DAVIS-STRAIT
Hellefiske-Holsteinsborg Banke
Kangerdluarssuk
Itivdleq
Sarkarmiut
Sawssat
Søndre Strömfjord
Kangâmiut
Agnamiut
Sukkertoppen
Lille Hellefiske Banke
Atangmik
Godthaab
Fyllas Klik Bænk Banke
Grædefjorden
Fiskenæsset
Lichtenfels
Nerutusoq
Frederikshaab
Kvanefjord
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Augmilagtok
Cape Farewell
Inland Ice
Settlement
Outlying post or dwelling place
W. f. Greenw.

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